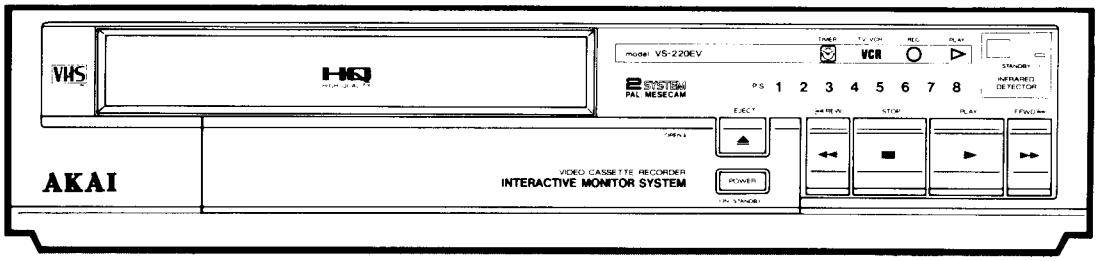
VS-220EV

AKAI SERVICE MANUAL



VIDEO CASSETTE RECORDER

MODEL VS-220EV

SPECIFICATIONS

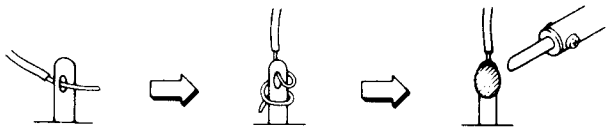
Format	VHS standard
Video recording system	Rotary, slant azimuth two-head helical scan system
Rotary heads	Two video heads
RF input	System B, G VHF ch 2 – 12, UHF ch 21 – 69
RF output	System B type modulation VHF ch 3, 4 switchable (preset ch 4)
Recording (line input)	PAL, CCIR (System B, G, I)
Playback (line output)	PAL, CCIR (System B, G, I)
Video	
Line input level	0.5 – 2.0 Vp-p/75 ohms, unbalanced
Line output level	1.0 Vp-p/75 ohms, unbalanced
S/N ratio	more than 45 dB
Horizontal resolution	more than 250 lines
Audio	
Line input level	–8 dBm/50 K ohms, unbalanced
Line output level	–6 dBm/ 1 K ohms, unbalanced
S/N ratio	more than 40 dB
Frequency response	70 – 10,000 Hz
Recording/playback time	240 min. with E-240 cassette
Tape speed	23.39 mm/sec.
Quick finder	approx. 7 times normal speed
FF, REW time	approx. 5 min. with E-240 cassette
Timer	
Program	4 program/2 week and sleep timer
Clock reference	Quartz crystal
Display	TV screen (Tape counter, Timer etc.)
Power requirements	115/230 V AC, 50/60 Hz
Power consumption	28 W
Operating temperature	5°C – 40°C
Dimensions	425 (W) x 95 (H) x 345 (D) mm
Weight	5.9 Kg

* For improvement purposes, specifications and design are subject to change without notice.

★SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol parts are critical for safety. Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation.
   These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locatoins.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 M ohms. but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be headphone jacks line-in-out jacks etc. more than 2.2 M ohms (ground terminals, microphone jacks).

★INFORMATION

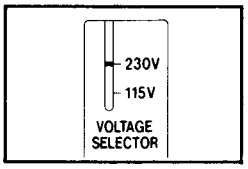
SYMBOLS FOR PRIMARY DESTINATION

Alphabet indicates the destination of the units as listed below.

Symbols	Principal Destinations
[A]	USA
[B]	UK
[C]	Canada
[E]	Europe (except UK)
[J]	Japan
[S]	Australia
[V]	W. Germany only
[U]	Universal Area
[Y*]	Custom version

VOLTAGE CONVERSION

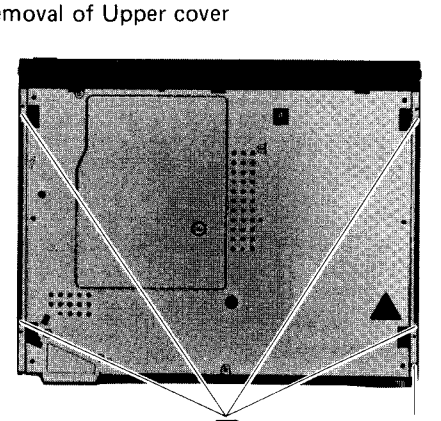
Set the VOLTAGE SELECTOR with a screwdriver to voltage for your area.



I. DISASSEMBLY

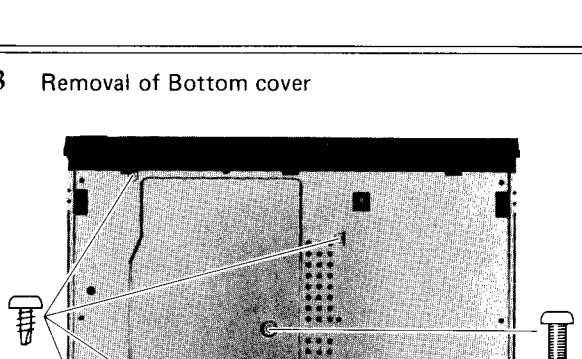
In case of trouble, etc, necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

1 Removal of Upper cover

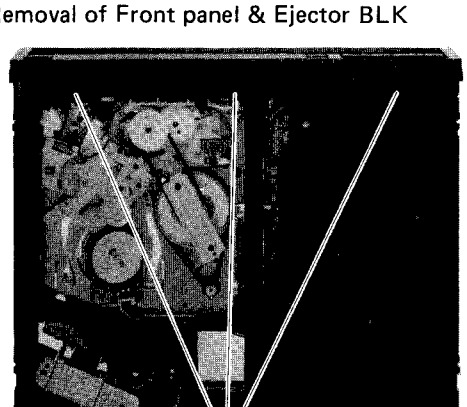


2

3 Removal of Bottom cover



4 Removal of Front panel & Ejector BLK



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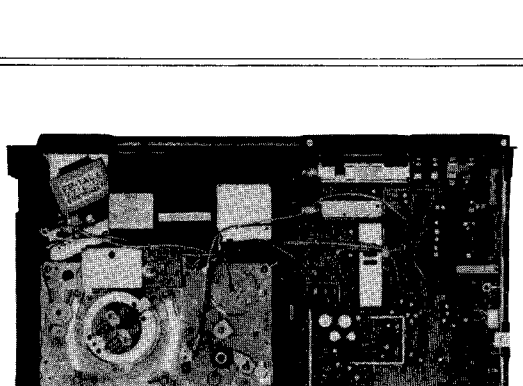
6



II. CONTROLS

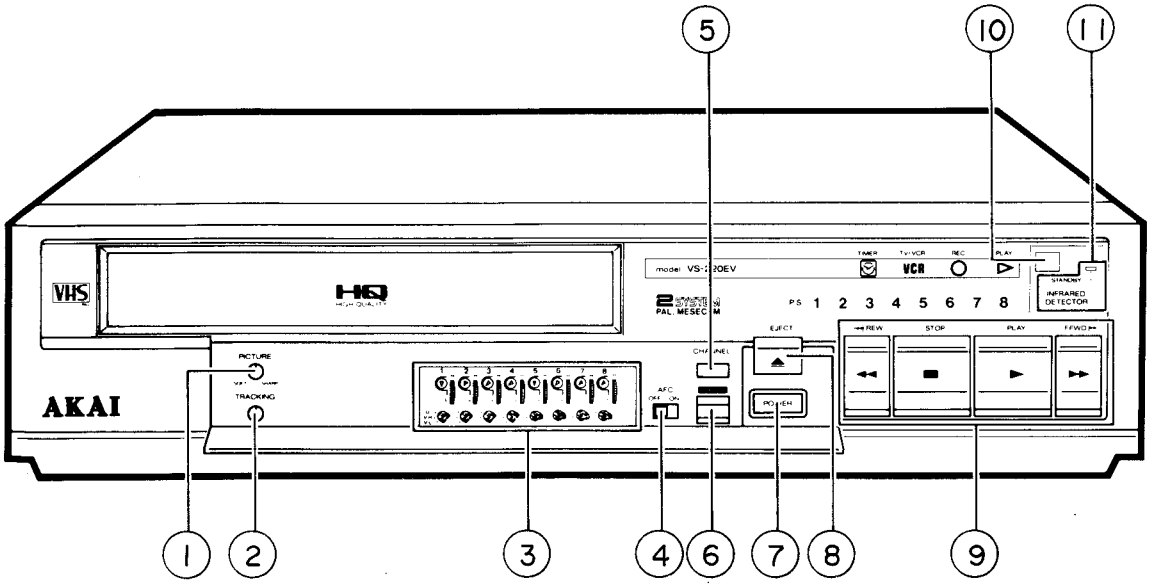


Fig. 2-1 Front View

1. SOFT/SHARP PICTURE CONTROL
2. TRACKING CONTROL
3. TUNING CONTROL
4. AFC SWITCH
5. CHANNEL SELECT BUTTON
6. REC BUTTON
7. POWER BUTTON
8. EJECT BUTTON
9. TAPE TRANSPORT BUTTONS
10. REMOTE CONTROL SENSOR
11. STAND-BY INDICATOR/INFRARED DETECTOR

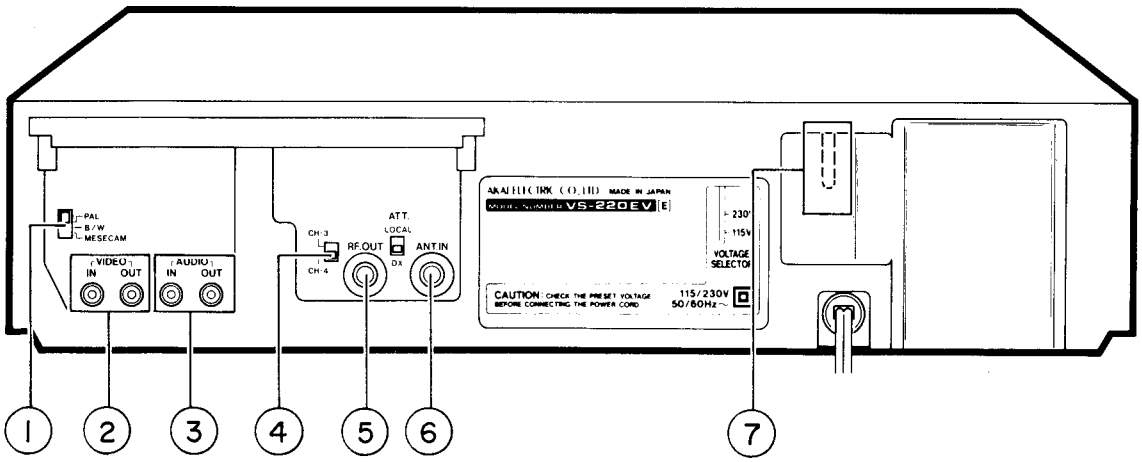
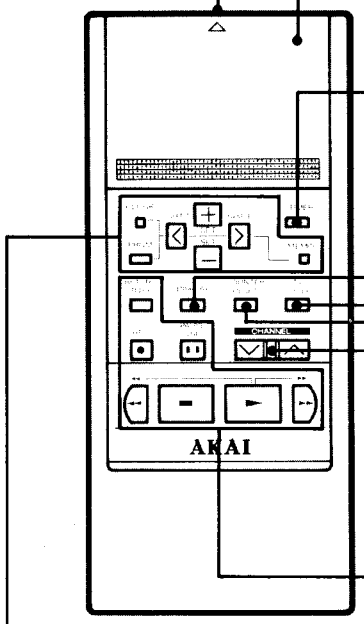


Fig. 2-2 Rear View

1. VIDEO MODE SELECTOR
2. VIDEO IN/OUT JACKS
3. AUDIO IN/OUT JACKS
4. RF OUT CHANNEL SELECTOR
5. RF OUT TERMINAL
6. ANT IN JACK
7. VOLTAGE SELECTOR

REMOTE CONTROL UNIT RC-V220

The remote control contains operation buttons which are used the same way as the operation buttons on the front panel of the Akai VCR, and many which appear on the remote control only. The remote control can be used from a distance of up to 5 meters.



Transmitter beam

POWER button. (Hidden under cover.)

TIMER button.
To stand-by for automatic recording.

DISPLAY button.
To choose the CLOCK/COUNTER and display it on the TV screen.

TV/VIDEO selector button and indicator
To select the input signal to the home TV.

Counter RESET button.
To reset the tape counter to "0000".

Channel button.

Tape transport buttons

To set and store all the CLOCK and PROGRAM settings.
SET and SHIFT and MEMO buttons. See p. 7, 12.
PROGRAM button.
CLOCK button.

III. PRINCIPAL PARTS LOCATION

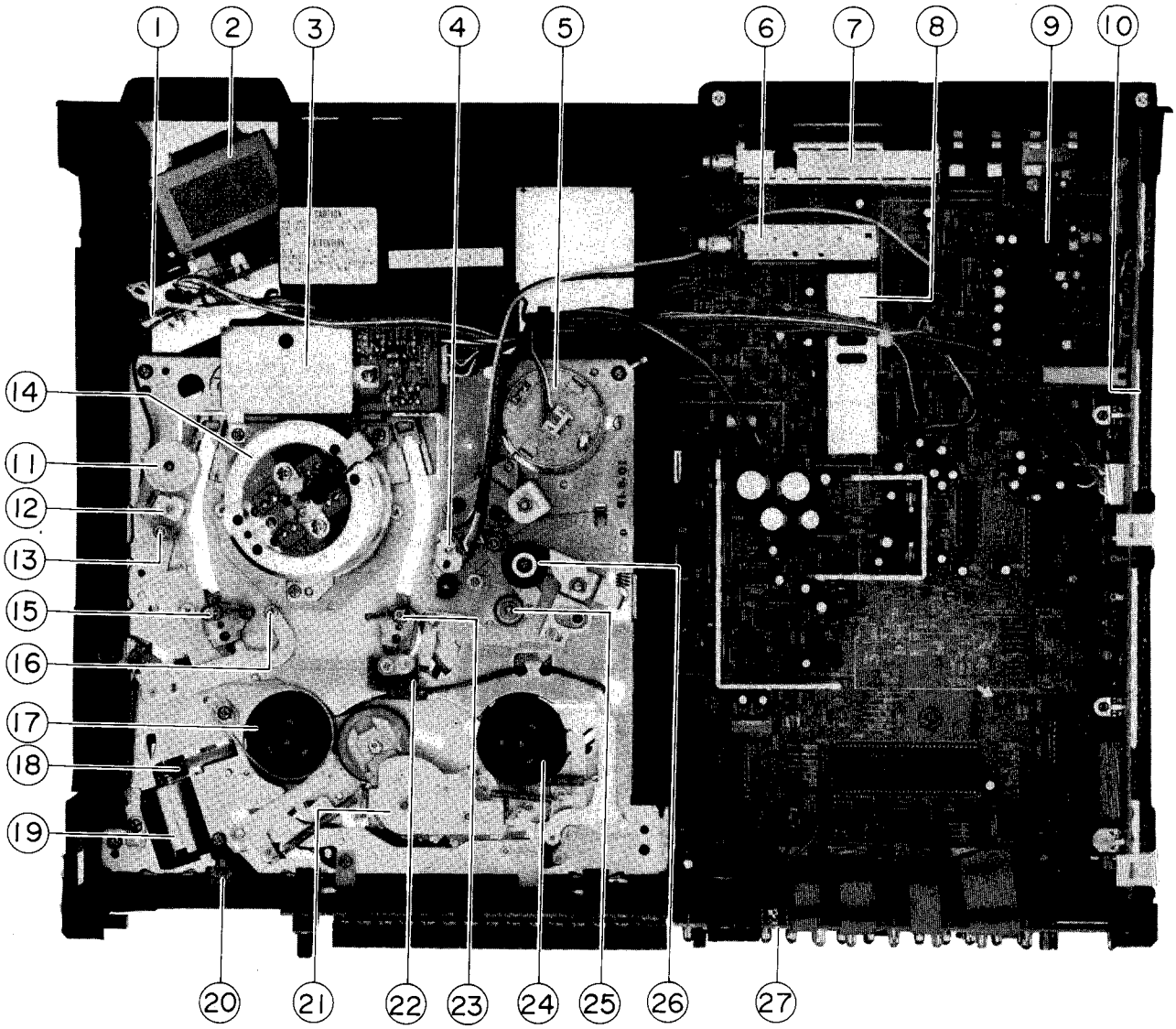


Fig. 3-1 Top View

1. TRANS PCB
2. POWER TRANSFORMER
3. PREAMP PCB
4. AUDIO/CONTROL HEAD
5. CAPSTAN MOTOR (M902)
6. TUNER UNIT
7. RF CONVERTER
8. VIF UNIT
9. MAIN PCB
10. MAIN (VIDEO) PCB
11. IMPEDANCE ROLLER
12. FULL TRACK ERASE HEAD
13. SUPPLY TAPE GUIDE
14. HEAD DRUM BLK
15. LOADING LEADER LEFT
16. TENSION ARM
17. SUPPLY REEL TABLE
18. SYNCHRO BELT
19. LOADING MOTOR (M903)
20. REC SAFETY SWITCH (SW1)
21. TAKE UP GEAR BLOCK
22. SENSOR LED
23. LOADING LEADER RIGHT
24. TAKE UP REEL TABLE
25. CAPSTAN SHAFT
26. PINCH ROLLER
27. OPERATION PCB

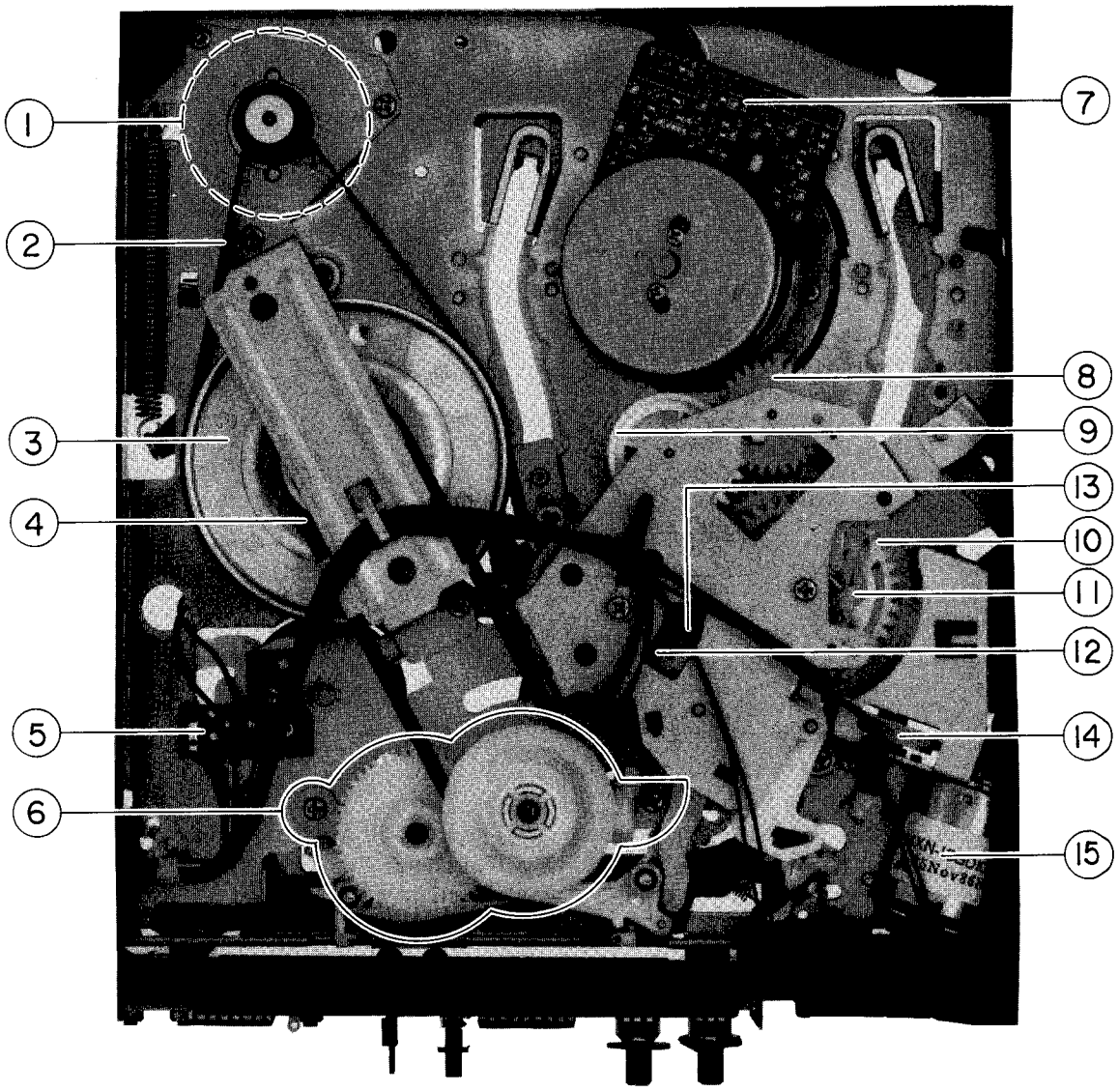


Fig. 3-2 Bottom View

1. CAPSTAN MOTOR
2. CAPSTAN BELT
3. CAPSTAN FLYWHEEL
4. IDLER BELT
5. REEL SENSOR PCB
6. TAKE-UP GEAR BLOCK
7. DRUM MOTOR BLOCK
8. SUPPLY LOADING GEAR
9. TAKE-UP LOADING GEAR
10. EJECT CAM GEAR
11. EJECT SWITCH
12. ROTARY ENCORDER
13. MAIN GEAR CAM
14. SYNCHRO BELT
15. LOADING MOTOR

IV. MECHANICAL ADJUSTMENT

4-1. BACK TENSION ADJUSTMENT

1) Remove the EJECTOR BLK. and disconnect J406 from P406 on the MAIN PCB. (Refer to dismantling of EJECTOR BLK. to chapter I.)
2) Depress the Power button on the Front Panel.
3) Short pin ③ and pin ⑤ of P406 to maintain cassette tape loaded mode with a tweezer or some jamper wires as shown in Fig. 4-1.

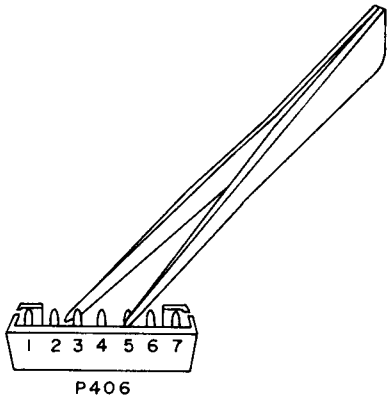


Fig. 4-1

4) Set the Back Tension jig (AT-751181) and put some weight on the Back Tension jig as a stabilizer.
5) Press the PLAY button, then check and adjust back tension as 30 ~ 35 g-cm by the TENSION HOLDER position.

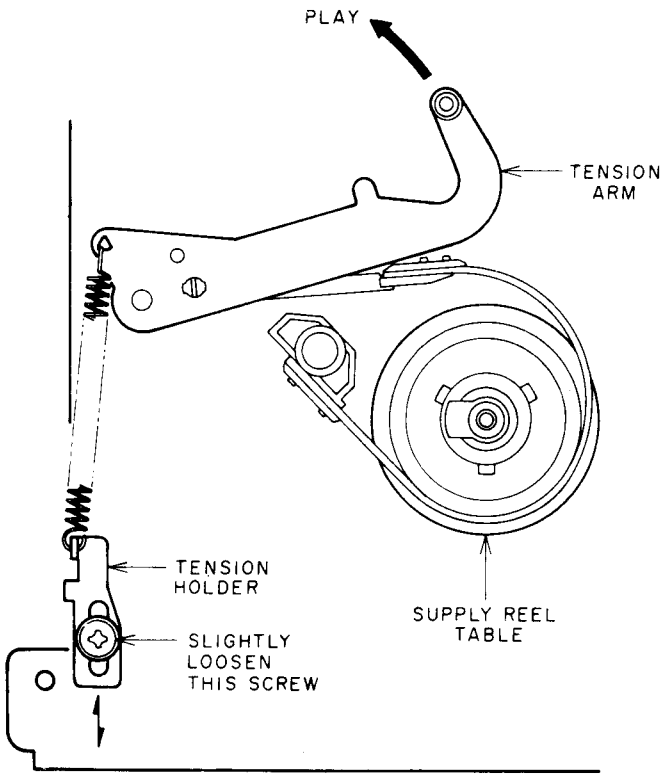


Fig. 4-2

4-2. LOADING LEADER HEIGHT ADJUSTMENT

1) Slightly loosen the set screws at the lower part of the LOADING LEADER so that the LOADING LEADER can be adjusted with reasonable tightness. Adjust the coarse height of the LOADING LEADER from the base mount as 0.6 to 0.8 mm.
2) Set the reference tape TF-530RFS (AT-751775) and press the PLAY button.
3) Connect an Oscilloscope to RF ENVELOPE test terminal TP1 on the MAIN (VIDEO) PCB.
   Turn the LOADING LEADER height adjustment screw head to obtain the flat envelope as Fig. 4-5 ideal envelope.

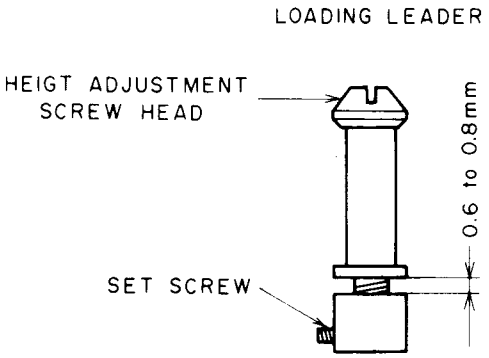


Fig 4-3

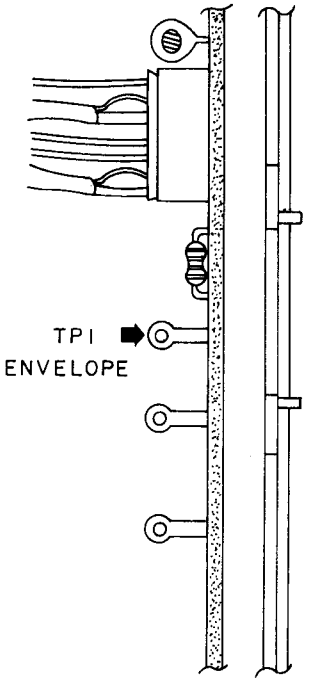


Fig. 4-4 MAIN (VIDEO) PCB.

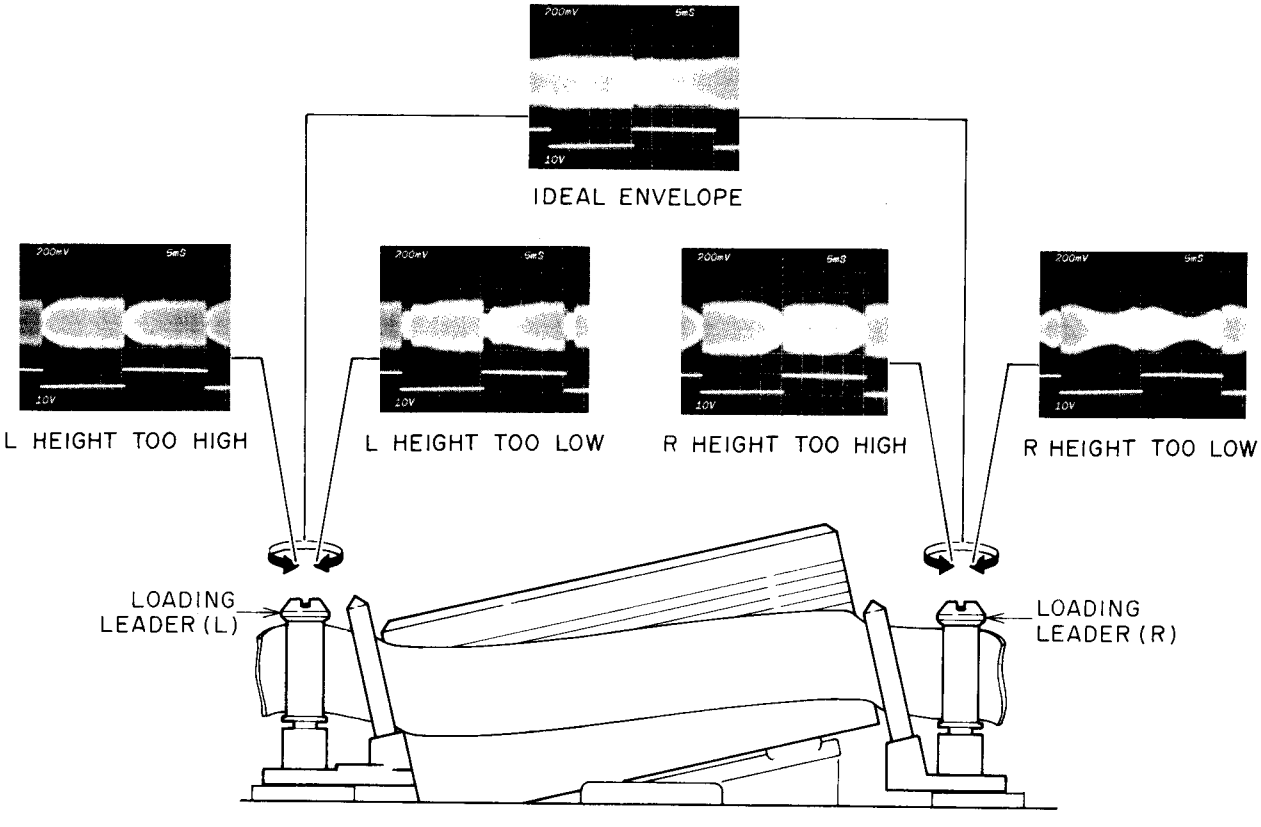


Fig. 4-5

4-3. TAPE CURL AT TAKE-UP TAPE GUIDE ADJUSTMENT

Turn the screw ⓐ on the A/C HEAD BLK so that the down edge of the tape touches the TAKE-UP TAPE GUIDE lower part without any curl or waving.

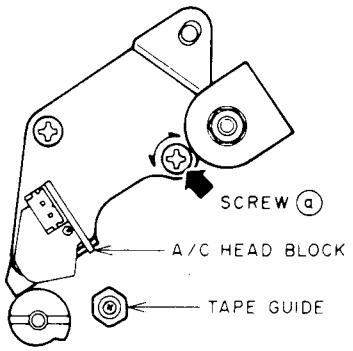


Fig. 4-6

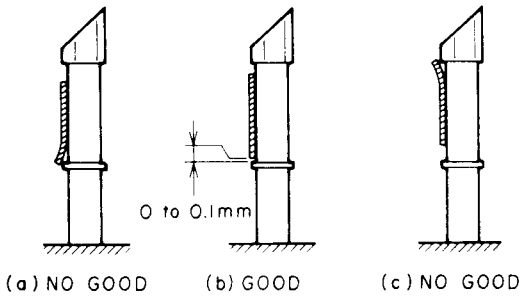


Fig. 4-7

4-4. AUDIO HEAD AZIMUTH ADJUSTMENT

1) Turn the NUT ⓐ for coarse A/C BLOCK height adjustment as in Fig. 4-7, 8.

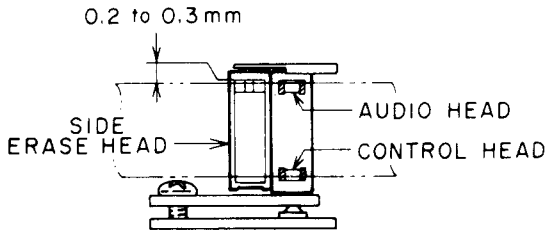


Fig. 4-8

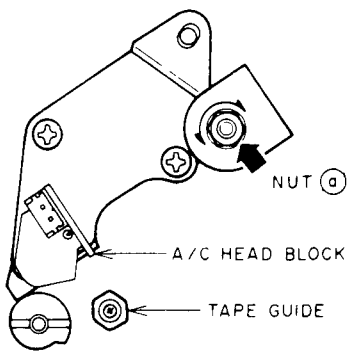


Fig. 4-9

2) Connect an oscilloscope or a AC voltmeter to the AUDIO LINE OUT
3) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
4) Turn the screw ⓑ to obtain the maximum audio signal output.

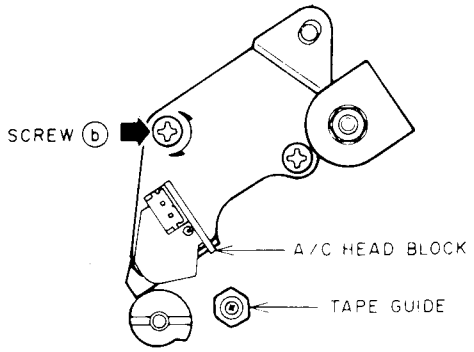


Fig. 4-10

4-5. RF ENVELOPE ADJUSTMENT

1) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
2) Slightly turn the LOADING LEADER HEIGHT ADJUSTMENT SCREW HEAD (L) (R) to obtain the IDEAL ENVELOPE as shown in Fig. 4-5.

4-6. TAPE CURL AT SUPPLY TAPE GUIDE ADJUSTMENT

1) Check the tape curl at Supply Tape Guide slightly turn the NUT ⓐ if the tape curl exists.

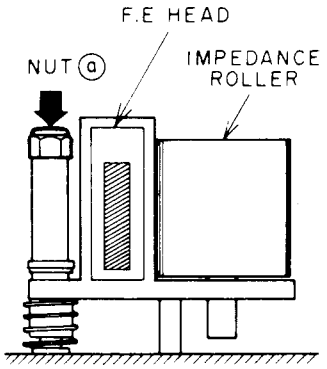


Fig. 4-11

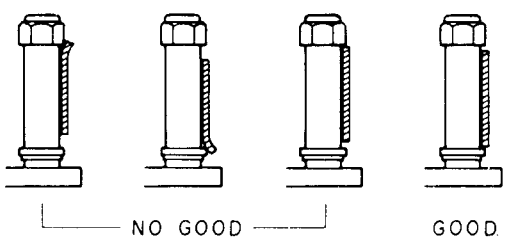


Fig. 4-12

4-7. AUDIO HEAD HEIGHT ADJUSTMENT

1) Connect an oscilloscope or a AC Voltmeter to the LINE AUDIO OUT.
2) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
3) Slightly turn the NUT ⓐ shown in Fig. 4-9 to obtain the maximum aduio output.

4-8. CONTROL HEAD POSITION ADJUSTMENT

1) Connect an oscilloscope to RF ENVELOPE test terminal TP1 on the MAIN (VIDEO) PC Board.
2) Set the reference tape TF-530RFS (AT-751775) and depress the PLAY button.
3) Set the Tracking Control Volume to center click position.
4) Adjust Mechanical Tracking Adjustment Screw ⓐ to obtain the maximum RF ENVELOPE.

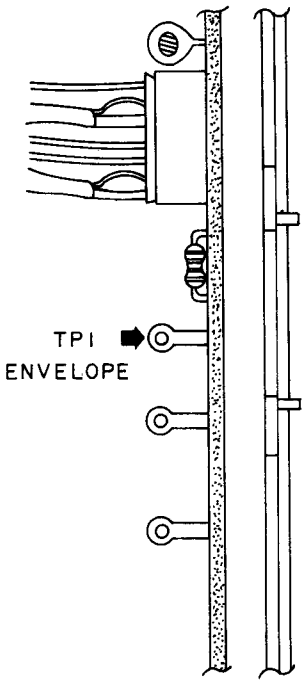


Fig. 4-13

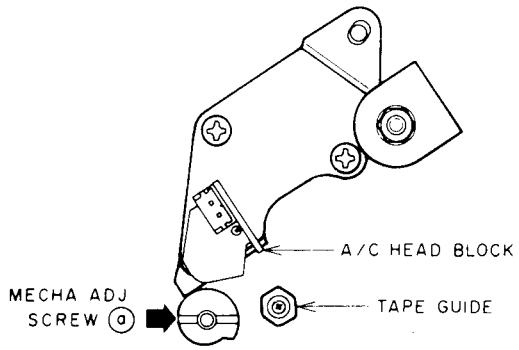


Fig. 4-14

4-9. CUE REVIEW ADJUSTMENT

1) Set a E-180 tape, press the PLAY and the F.FWD button (CUE mode).
2) Turn the CUE/REVIEW GUIDE height adjustment Nut ⓒ so that the wrinkle between the PINCH ROLLER and the CUE/REVIEW GUIDE are not existed.
3) Depress the REV button (REVIEW mode) confirm the curl at the tape down edge is not existed at the TAPE GUIDE as shown in Fig. 4-7.
   Fig. 4-7 (c) is not acceptable, but Fig. 4-7 (b) is acceptable).

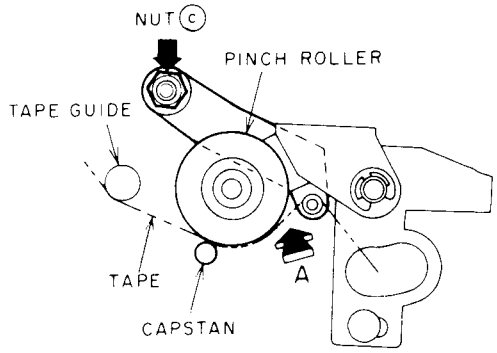


Fig. 4-15

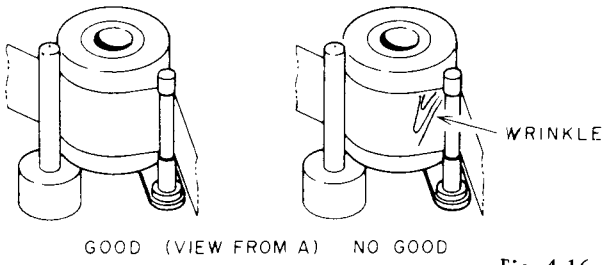


Fig. 4-16

After the adjustments, tighten the LOADING LEADER set screw.

V. HEAD DRUM REPLACEMENT

5-1. REPLACEMENT PROCEDURE

1) Remove the Drum Earth Brush.
2) Unsolder the four wires from the Rotary Trans, BLUE and BROWN for CH1, BLUE and RED for CH2.
3) Remove the Upper Drum Fixing Screw.
4) Install the Upper Drum. (Head Drum)
5) Tighten the Upper Drum Fixing Screws.
6) Resolder the four wires from the Rotary trans.

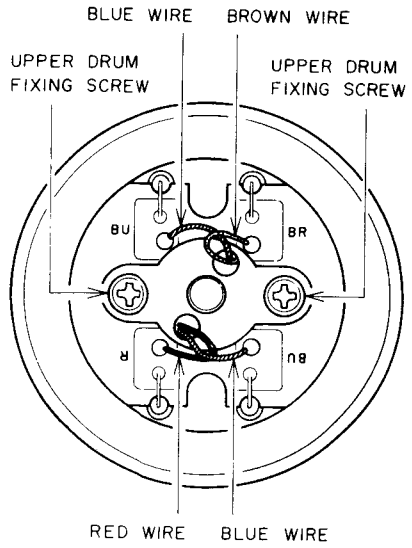


Fig. 5-1

NOTE: Height precisior is required for the proper performance, and the head tips are fragile, so the following points should be noted when replacing the upper drum block.

(a) Do not loosen the set screw on the collar preload.
(b) Before fixing, clean both surfaces where the upper drum and the rotary transformer part meet with alcohol.
(c) When installation of upper drum, if it does not go on to the shaft easily, clean the hole in the upper drum with alcohol and put a little oil on the shaft.
(d) Make sure that the upper drum fixing screw holes on the rotary transformer part and the upper drum fixing screw penetration holes match exactly before inserting the fixing screws.
(e) Tighten the two upper drum fixing screws alternately and gradually. Tighten them at 6 kg-cm torque.

5-2. AFTER REPLACEMENT

After replacement, the following adjustments and confirmations are necessary for the proper performance.

1) Tracking preset adjustment. (Servo adjustment Step 2)
2) PB switching point adjustment. (Servo adjustment Step 3)
3) REC current adjustment. (Video adjustment Step 1)

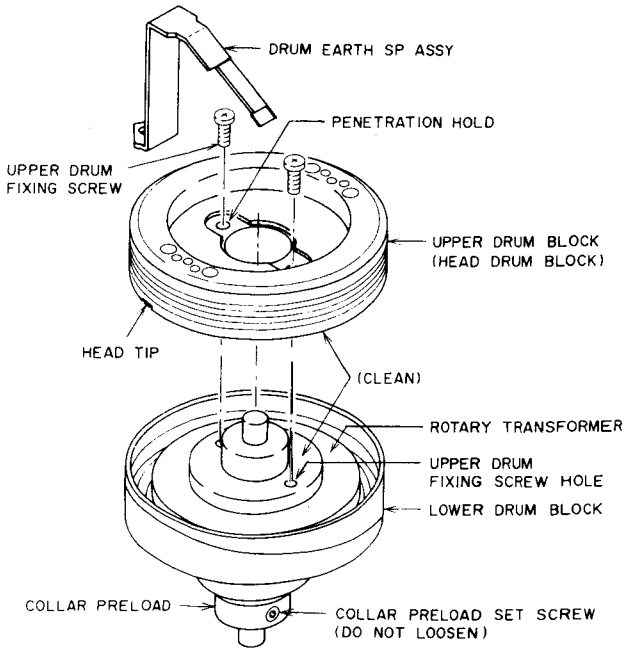


Fig. 5-2

VI. HOW TO MOUNT THE ROTARY PLATE

When mounting the rotary plate on the drum motor, be sure to align the mark (Small round hole) on the rotary plate (a) with the collar preload set screw (d) on the collar preload (c) as illustrated above.

NOTE: Do not attempt to remove the collar preload (c) on the head assy. If removed, a special jig is needed for reinstallation, which almost always requires replacement of the drum assy.

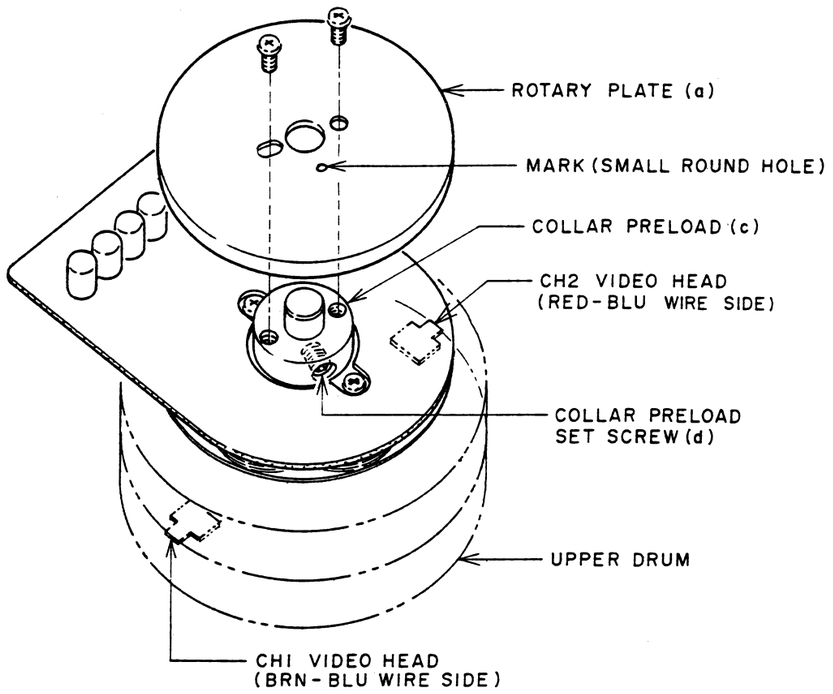


Fig. 6-1 How to Mount the Rotary Plate

VII. HOW TO ASSEMBLE LOADING MECHANISM

1) With the unit unloaded, attach Gear Loading (S) BLK and Gear Loading (T) BLK to Mecha chassis so that align the mark.

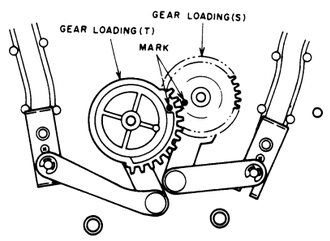


Fig. 7-1

2) Attach Gear Cam Eject to Mecha chassis so that align the marks.

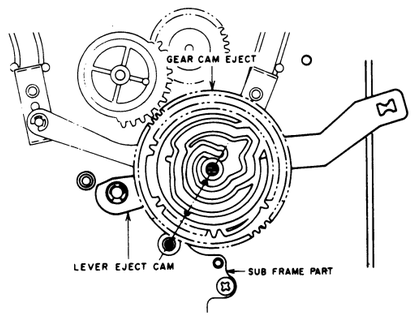


Fig. 7-2

3) Attach Gear Cam Main to Mecha chassis so that Pin Ⓐ of Lever P Cam and Pin Ⓑ of Lever Cam Slide mate oval hole of Gear Cam Main.

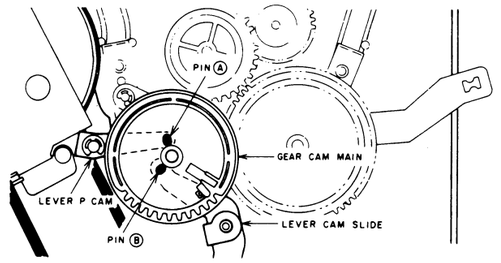


Fig. 7-3

4) Attach Lever Cam Tension to Mecha chassis so that Pin Ⓐ goes into valley of Gear Cam Eject.
5) Attach Lever Cam F/R to Mecha chassis so that Pin Ⓑ goes into valley of Gear Cam Eject. and Pin Ⓒ of Plate F/R Slide (2) Part into hole of lever Cam F/R.

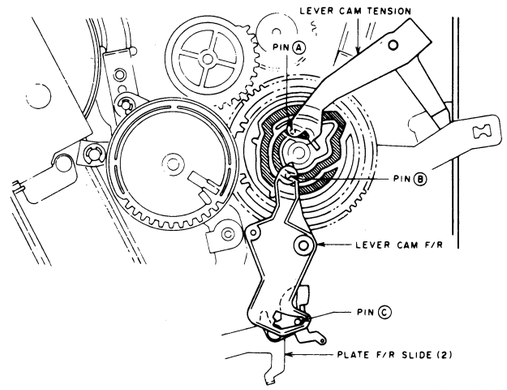


Fig. 7-4

6) Attach Arm Set Free onto Lever Cam Slide.

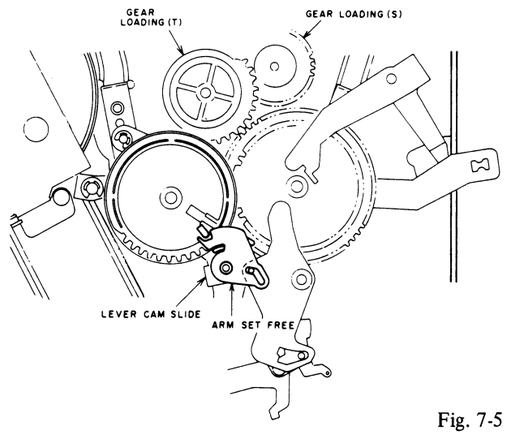


Fig. 7-5

7) Attach Mode SW BLK to Mecha chassis so that the latch of Rotary Encoder goes into slit Ⓐ of Gear Cam Main and tighten with screw Ⓑ

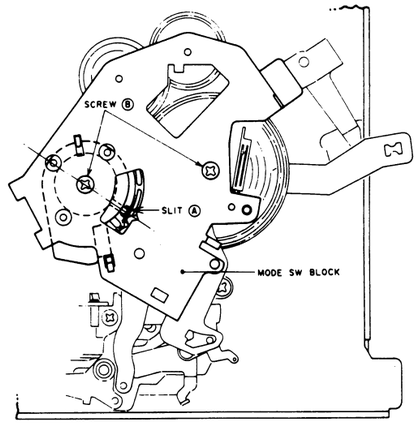


Fig. 7-6

8) Mount Loading Motor BLK and tighten with screw Ⓐ

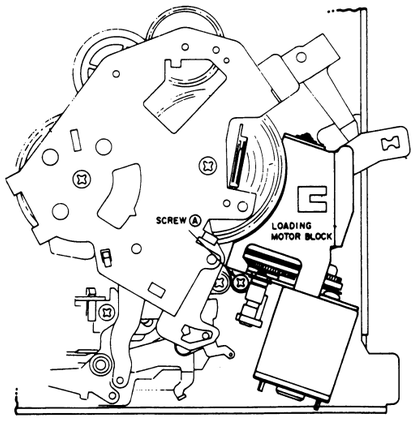


Fig. 7-7

VIII. ELECTRICAL ADJUSTMENT

8-1. MAIN PCB ADJUSTMENTS

Precautionary items prior to adjustments

1. The color bar generator output should be 1.0 Vp-p.
2. Video output terminal should be terminated with 75 ohms (dummy or load).

Required following Test tapes.

Test Tape	Part No.
TF-530RFS TF-527BL	AT-751775 AT-711880

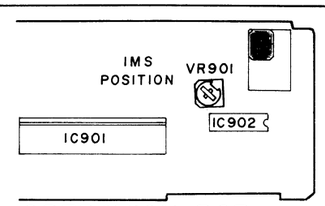
STEP	ADJUSTMENT ITEM
1.	MODE and INPUT SIGNAL/TEST TAPE
2.	TEST POINT and ADJ. part
3.	RESULT & REMARKS

ADJ. part

Test point

IMS POSITION

1. "E-E" Input NTSC color bar signal.
2. TV screen & VR901.
3. • Depress the PROGRAM button on the REMOTE CONTROLLER to display the information for programming on the TV screen.
   • Adjust VR901 so that charactors located center of the TV screen.



AUDIO ADJUSTMENT

3	AUDIO AZIMUTH

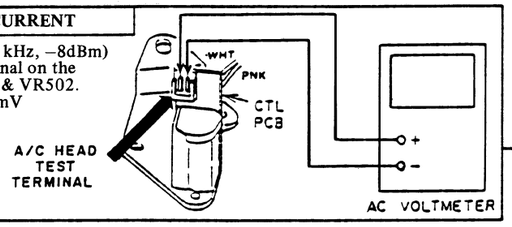
1. "PB" Test tape TF-530RFS.
2. AUDIO OUT.
3. Confirm −6 ~ −14 dBm. (TF-508RF: −5 ~ −11 dBm)

1	AUDIO PB LEVEL

1. "PB" Test tape TF-527BL.
2. Audio out & VR501.
3. −3.0 ± 0.5 dBm (TF-513L: −9.0 ± 0.5 dBm)

2	REC CURRENT

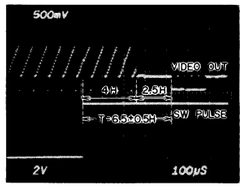
1. "REC" (1 kHz, −8dBm)
2. Test terminal on the A/C Head & VR502.
3. 2.9 ± 0.1 mV



SERVO ADJUSTMENT

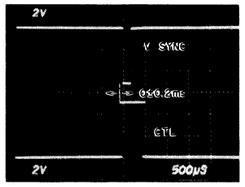
3	PB SWITCHING POINT

1. "PB" Test tape TF-530RFS.
2. TP-Video out, P204 pin 1 (SW. P) for trigger signal & VR201.
3. Adjust "T" to 6.5 ± 0.5 H



2	TRACKING PRESET

1. "PB" Test tape TF-530RFS.
2. Test terminal P204 pin 2 (CTL), pin 3 (V-SYNC) & VR202.
3. • Set the TRACKING Control to center click position.
   • Adjust VR202 so that the phase at raising part of CTL pulse and V-SYNC pulse are lined up.

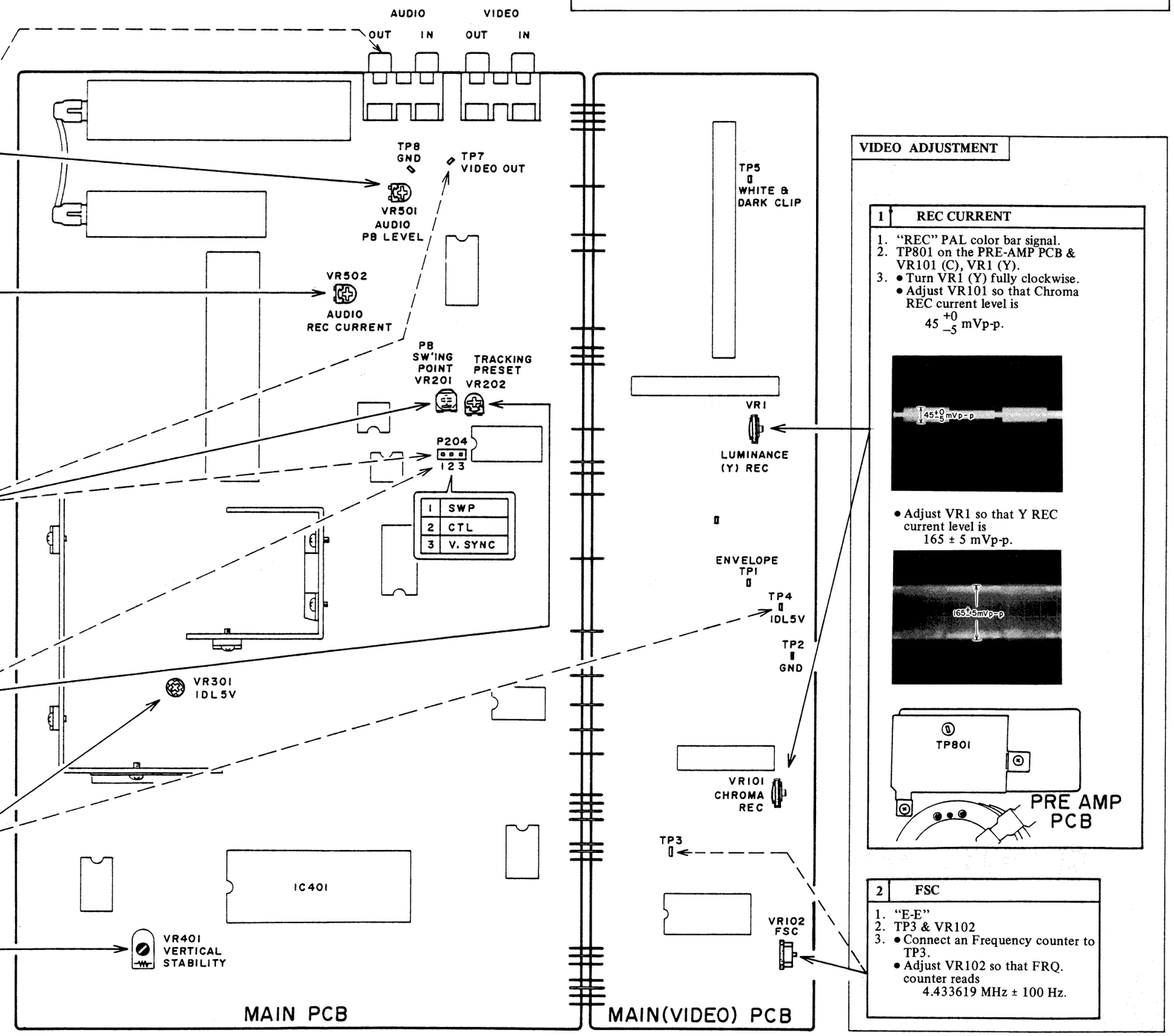


1	IDL 5V

1. "E-E" (stop mode)
2. TP4 (IDL 5V) & VR301
3. 5.1 ± 0.05 V

4	VERTICAL STABILITY

1. "REC" TV program and PB/PAUSE
2. TV screen & VR401
3. Minimum vibration of still picture.



VIDEO ADJUSTMENT

1	REC CURRENT

1. "REC" PAL color bar signal.
2. TP801 on the PRE-AMP PCB & VR101 (C), VR1 (Y).
3. • Turn VR1 (Y) fully clockwise.
   • Adjust VR101 so that Chroma REC current level is $45\ ^{+0}_{-5}$ mVp-p.

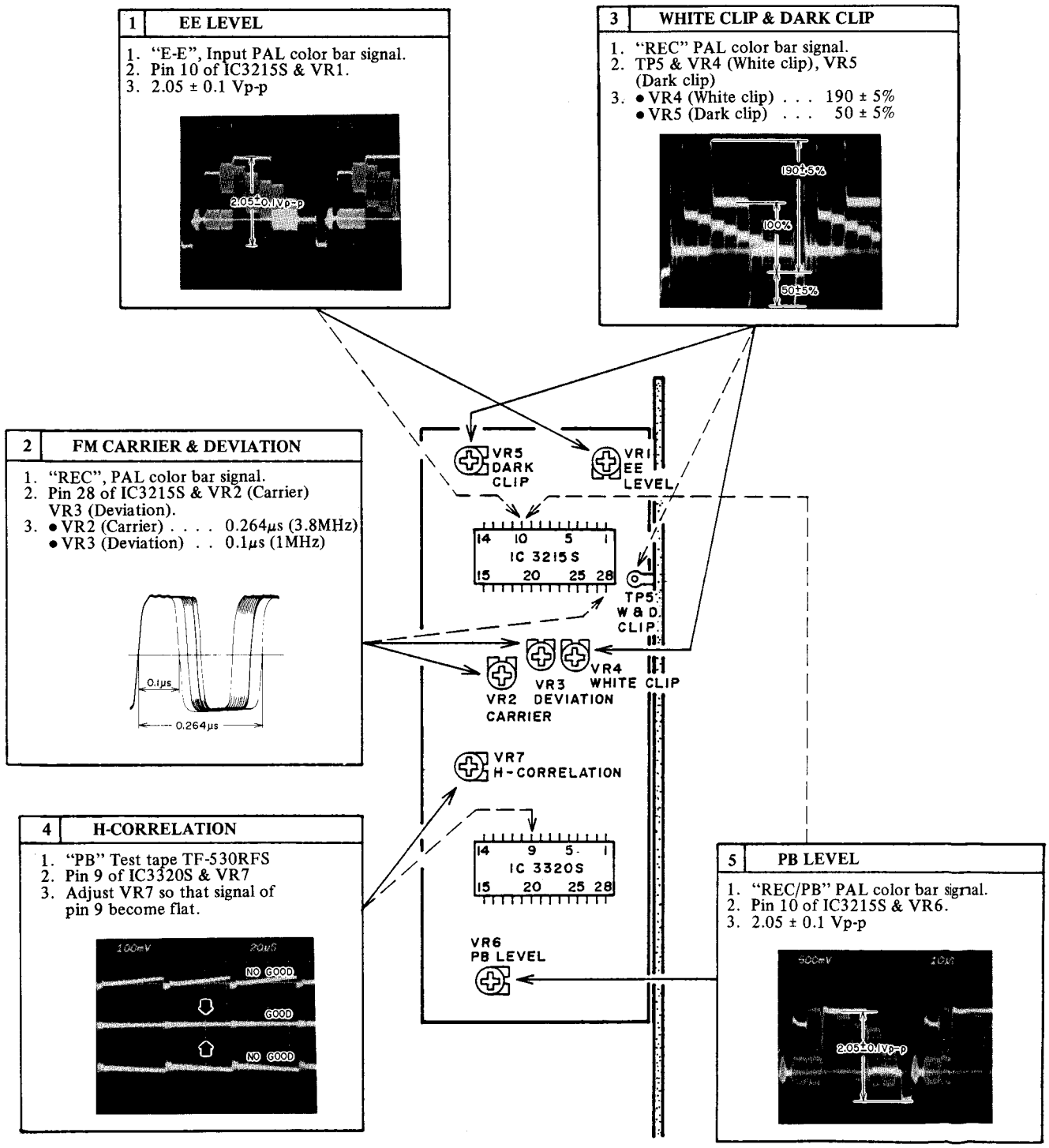
• Adjust VR1 so that Y REC current level is 165 ± 5 mVp-p.

2	FSC

1. "E-E"
2. TP3 & VR102
3. • Connect an Frequency counter to TP3.
   • Adjust VR102 so that FRQ. counter reads 4.433619 MHz ± 100 Hz.

8-2. LUMINANCE SIGNAL PROCESSING IC (EHM-M96A8U63K-II) ADJUSTMENTS

NOTE: These adjustment's are generally unnecessary, except when replacing this IC.


1 EE LEVEL
1. "E-E", Input PAL color bar signal.
2. Pin 10 of IC3215S & VR1.
3. 2.05 ± 0.1 Vp-p
2.05±0.1Vp-p
3 WHITE CLIP & DARK CLIP
1. "REC" PAL color bar signal.
2. TP5 & VR4 (White clip), VR5 (Dark clip)
3. • VR4 (White clip) . . . 190 ± 5%
• VR5 (Dark clip) . . . 50 ± 5%
190±5%
100%
50±5%
2 FM CARRIER & DEVIATION
1. "REC", PAL color bar signal.
2. Pin 28 of IC3215S & VR2 (Carrier) VR3 (Deviation).
3. • VR2 (Carrier) 0.264μs (3.8MHz)
• VR3 (Deviation) . . 0.1μs (1MHz)
0.1μs
0.264μs
VR5 DARK CLIP
VR1 EE LEVEL
14 10 5 1
IC 3215S
15 20 25 28
TP5 W & D CLIP
VR4 WHITE CLIP
VR3 DEVIATION
VR2 CARRIER
VR7 H-CORRELATION
4 H-CORRELATION
1. "PB" Test tape TF-530RFS
2. Pin 9 of IC3320S & VR7
3. Adjust VR7 so that signal of pin 9 become flat.
100mV
20μS
NO GOOD
GOOD
NO GOOD
14 9 5 1
IC 3320S
15 20 25 28
VR6 PB LEVEL
5 PB LEVEL
1. "REC/PB" PAL color bar signal.
2. Pin 10 of IC3215S & VR6.
3. 2.05 ± 0.1 Vp-p
500mV
10μS
2.05±0.1Vp-p

IX. PARTS LIST

ATTENTION

1. **When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.**
2. **Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.**
3. **Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.**

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	SP CS ANGLE ADJUST

- SP (Service Parts) Classification
- A small "x" indicates that this part is not shown in the Photo or Illustration.
- This number corresponds with the individual parts index number in that figure.
- This number corresponds with the Figure Number.

b) PC Board

6. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
6-C1B	EC-350949	C MMY V 223M 250DC [J]
6-C1C	EC-338397	C MMY V 223M 125AC [C,A]
6-X1	EI-318384	OSC X'TAL NC-18C

- Symbols for primary destination
  [A]: AAL(U.S.A.) [S]: SAA(Australia)
  [B]: BEAB(England) [U]: U/T(Universal Area)
  [C]: CSA(Canada) [V]: VDE(W. Germany)
  [E]: CEE(Europe) [Y]: Custom Version
  [J]: JPN(Japan)
- SP (Service Parts) Classification
- These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ (*) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

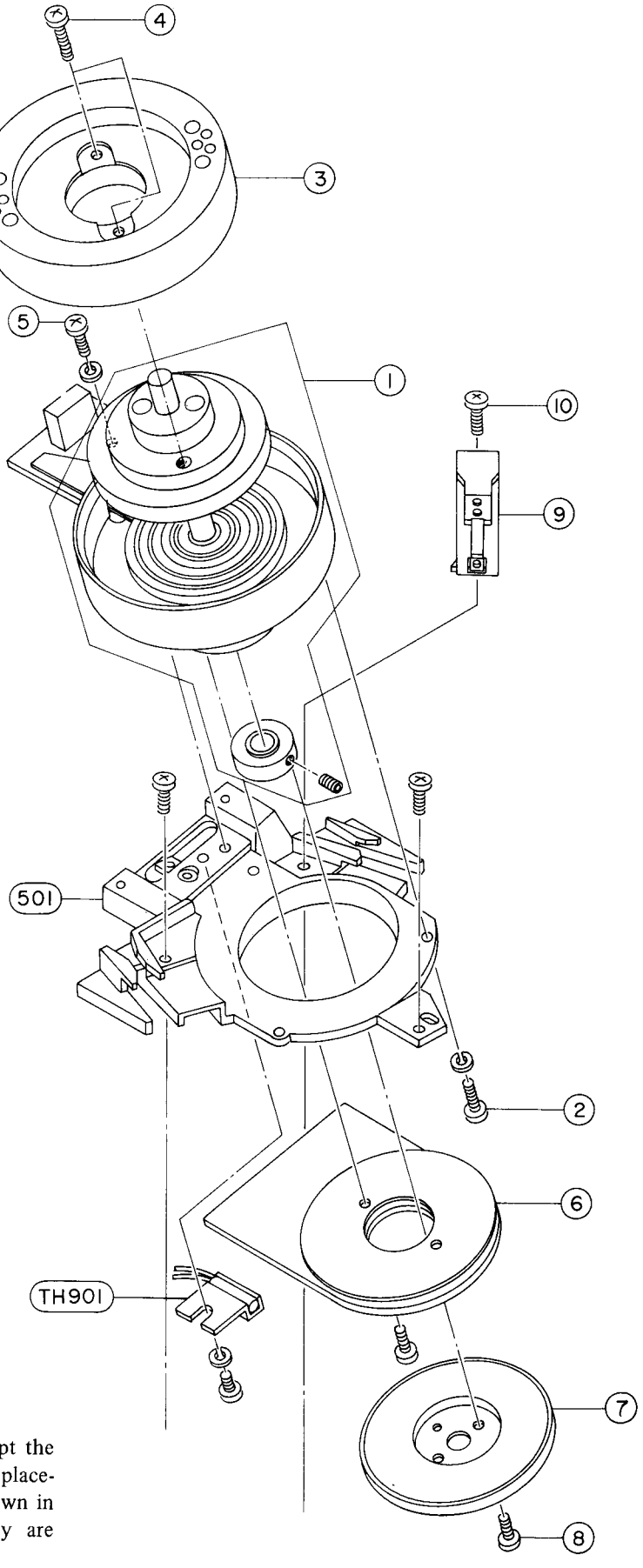
⚠ (*) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÉCES RECOMMANDEES PAR LÉ FABRICANT.

1. RECOMMENDED SPARE PARTS

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref. No.	Part No.	Description
1	BF-B360531-B	FLYWHEEL CAPSTAN PART
2	BL-B360350	ARM TENSION BAND PART
3	BM-B361467	LOADING MOTOR PART
4	BM-361544-B	MOTOR FG KCX-38FS5B
5	BM-M3224A020A	PC MOTOR BLK SM-240
6	BR-B365716-B	SUPPLY REEL TABLE PART 2
7	BR-B365715-B	TAKE-UP REEL TABLE PART 2
8	*BT-373316	TRANS POWER V69L-EV
9	BV-V1047A090A	LOADING LEADER(L) BLK VS-112EG
10	BV-V1047A080A	LOADING LEADER(R) BLK VS-112EG
11	BV-371162	RF CONV/BOOSTER EV
12	ED-356424	D LED BG5525S GREEN
13	ED-357540	D LED LN59
14	ED-355607	D LED PR5505S RED
15	ED-705414	D LED SE303A INFRARED
16	ED-360409	D PHOTO PN323B
17	ED-371398	D SILICON DSA17-FB8 F12
18	ED-371397	D SILICON DSF10T-FA6 F10
19	ED-344280	D SILICON H GMA-01-FY2 F05
20	ED-307572	D SILICON H 1SS131
21	ED-624903	D SILICON H 1S2473
22	ED-367202	D SILICON S5566B F12
23	ED-361915	D ZENER H HZS8.2J B3 F05
24	ED-370786	D ZENER H HZS9.1J B2 F05
25	ED-362998	D ZENER H HZS9.1J B3 F05
26	ED-367502	D ZENER H HZS9L A1 F05
27	ED-346582	D ZENER H HZ30L 1
28	ED-337292	D ZENER H HZ5 B1
29	EE-360406	TUN-UNIT UBH02 8CH 203
30	*EF-344106	FUSE ICP-N10 50V 0.4A
31	EF-623103	FUSE SEMKO T 250V 1.00A
32	EF-258344	FUSE SEMKO T 250V 800MA
33	EH-347743	COMP R RKC1/8B4 103J
34	EH-360340-A	DL EFD-EN645A31P
35	EH-371021	DL EFD-HR124A13J
36	EH-360339	FILTER LC AP AF-25P
37	EH-364045	FILTER LC FF-78P
38	EH-373144	FILTER LC LP LF-69P-02 5P
39	EI-360561	IC AN3792
40	EI-360563	IC AN3794
41	EI-360648	IC BA5115
42	EI-353421	IC BA6229
43	EI-352714	IC HA11752
44	EI-371023-A	IC HH3201P
45	EI-367571	IC LA6358T
46	EI-370727	IC MB88501-478M
47	EI-366681	IC MB88521-140M
48	EI-360560	IC MN6178XAL
49	EI-360404	IC M50450-011P
50	EI-356811	IC M5224P
51	EI-360564	IC M54548L
52	EI-360396	IC S-8054HN
53	EI-370614	IC TA8604N
54	EI-719456	IC TC9012F-172
55	EI-363347	IC TC9018P
56	EI-367271	IC UPC1490HA
57	EI-358506	IC UPC1513HA
58	EI-337530	IC UPC574J
59	EI-347991	OSC CE CSA6.00MS 6MHZ
60	EI-710044	OSC CE CSB455EB 455KHZ
61	EI-356371	OSC X'TAL MS-309 4.194304MHZ
62	EI-309878	OSC X'TAL 4.433619MHZ
63	*ER-360559	R FUSE H F12 RF50S 1/2W 1R0J
64	*ER-348272	R FUSE H S10 ERD2FC 1/4W 12R0G
65	*ER-362256	R FUSE H S10 ERQ14LE 1/4W R47K
66	*ER-372129	R FUSE H S10 ERQ14LE 1/4W 2R2K
67	*ER-362257	R FUSE H S17 ERQ-12H 1/2W R47K
68	*ER-371796	R FUSE H S17 ERQ-12H 1/2W 1R0J
69	ES-360433	SW LEAF MRX
70	ES-361479	SW LEAF MSW-1594C
71	ES-353622-A	SW PUSH EVQ-WU7001 02-2
72	ES-360408	SW SLIDE ESD-14187 1-01-02N
73	ES-363102	SW SLIDE HSW0690-01-750 2-3
74	ES-354430	SW SLIDE 00220950 02-02-2N
75	ES-349474	SW TACT SKHHAM004A
76	ET-361463	DETECTOR ON2170 Q,R
77	ET-356336	TR DTA114ES
78	ET-354415	TR DTA144ES
79	ET-353897	TR DTC114ES
80	ET-354365	TR DTC114YS
81	ET-364060	TR DTC143ES
82	ET-354414	TR DTC144ES
83	ET-354094	TR DTC144WS
84	ET-361490	TR PHOTO PN268 R,S
85	ET-360400	TR UN4210
86	ET-308472	TR 2SA1115 E,F,G F05
87	ET-349882	TR 2SA1283 D,E F05
88	ET-356224	TR 2SA1286 G,H,J F05
89	ET-352726	TR 2SA1392 T,U
90	ET-308977	TR 2SC2274K F F05
91	ET-308141	TR 2SC2603 G F05
92	ET-355669	TR 2SC3246 G,H,J F05
93	ET-360067	TR 2SC3330 T,U F05
94	ET-371028	TR 2SD1266 P,Q
95	ET-348948	TR 2SD1273 P,Q
96	ET-338565	TR 2SD1302 R,S
97	ET-372080	TR 2SD1330 S,T
98	ET-719455	TR 2SD1469
99	EV-369716	VR ROTARY RK09K1130 B103
100	EV-369717	VR ROTARY RK09K1130 B104
101	EX-361672	DEW SENSOR (HEATER) MRX
102	HE-361456	HEAD E HVFMD0005B
103	HR-361454	HEAD COMBO HVMLA1004C
104	MB-360534	BELT IDLER
105	MB-360533	BELT PAL
106	MB-364011	BELT SYNC NB930N15-020T
107	MP-361543-B	PINCH ROLLER PART
108	MZ-361314-A	GEAR (1)
109	MZ-360640-A	GEAR (2)
110	MZ-361313	GEAR (3)
111	MZ-360639	GEAR (4)
112	MZ-360638	GEAR (5)
113	MZ-364677	GEAR CAM EJECT(2)
114	MZ-364676	GEAR CAM MAIN(2)
115	MZ-B360642	GEAR EJECT PART
116	MZ-360384	GEAR LOADING (S)
117	MZ-360385-A	GEAR LOADING (T)
118	MZ-366960	GEAR TU BLK (2)
119	MZ-360453	WORM GEAR
120	VT-372187	ROTARY ENCORDER D2ZQ-R9-1
121	VT-360148-B	VERTICAL POLE PART

HEAD DRUM BLOCK

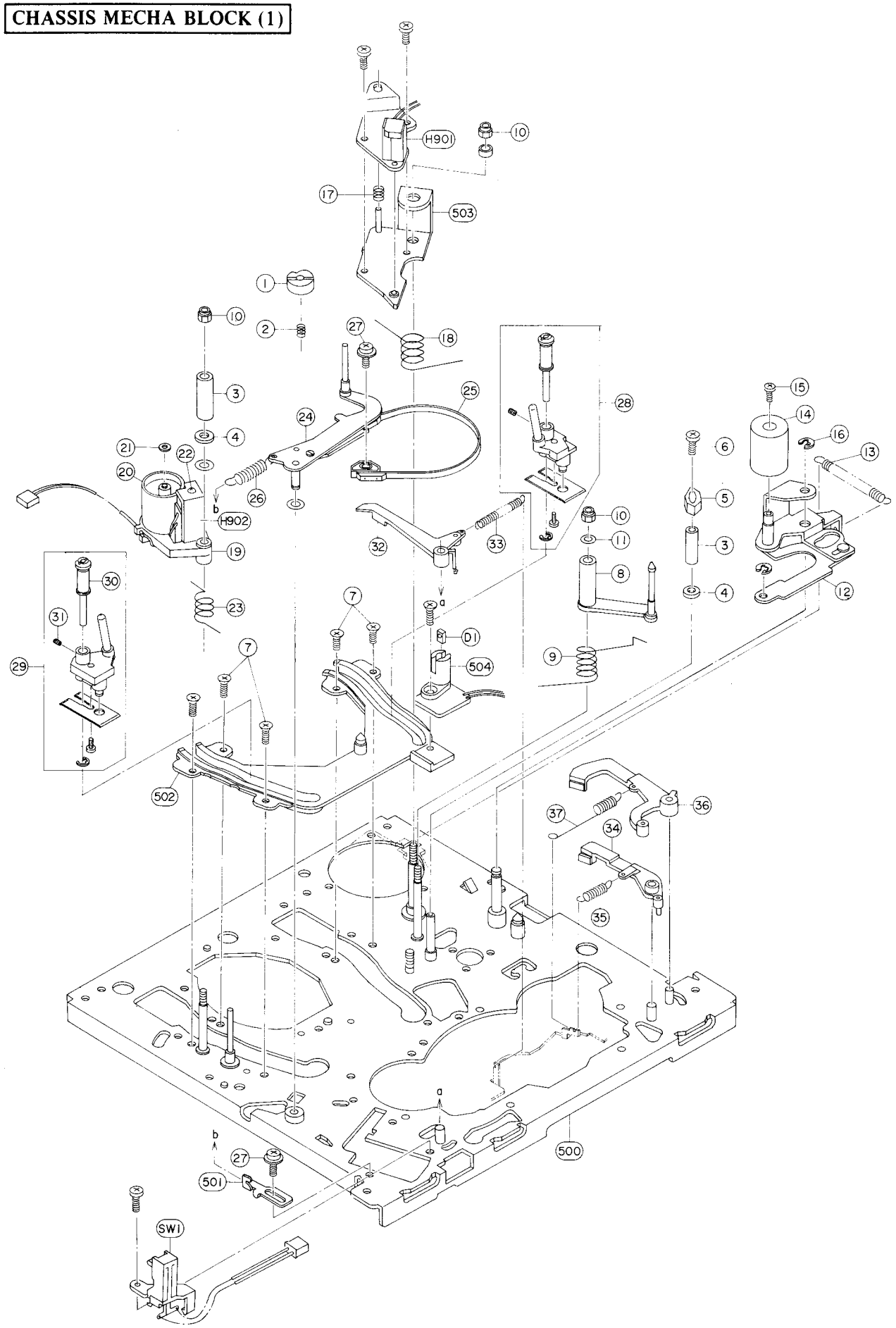


2. HEAD DRUM BLOCK

Ref. No.	Part No.	Description
2-1	BV-V1030A210F	LOWER DRUM BLK VS-240EG
2-2	ZS-354332	PAN26X08STL CMT SW
2-3	BV-V1030A220D	UPPER DRUM BLK VS-303EG
2-4	ZS-362241	BID30X09STL CMT
2-5	ZS-432843	PAN26X04STL CMT
2-TH901	EX-361672	DEW SENSOR (HEATER) MRX
2-6	BM-M3224A020A	PC MOTOR BLK SM-240
2-7	BV-B362443B	YOKE MAGNET (3) PART
2-8	ZS-356536	PAN26X06BRS NI3
2-9	VT-361452	DRUM EARTH SP ASSY(A)
2-10	ZS-421806	PAN30X08STL CMT

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

CHASSIS MECHA BLOCK (1)



3. CHASSIS MECHA BLOCK (1)

Ref. No.	Part No.	Description
3-1	ZS-360372-A	SCREW ADJUST
3-2	ZG-363349	SP PUSH ADJUST SCREW
3-3	MS-372186	GUIDE TAPE (6)
3-4	MS-370840-A	GUIDE TAPE (5)
3-5	MS-362181	GUIDE TAPE TU
3-6	ZS-608095	PAN20X05STL CMT
3-7	ZS-360391	SCREW SPECIAL
3-8	BL-B360353	LEVER REVIEW PART
3-9	ZG-360605	SP TORSION REVIEW ARM
3-10	ZW-350839	N30 NYLON
3-11	ZW-324417	PW31X060X050PSL
3-12	BL-B360361-B	ARM PINCH ROLLER PART
3-13	ZG-360602	SP PULL PINCH
3-14	MP-361543-B	PINCH ROLLER PART
3-15	ZS-477876	PAN20X03STL CMT
3-16	ZW-270101	RING E 300SUP CMT
3-17	ZG-313258	SP C-03.5/0.80-10.0 C-102
3-18	ZG-360603	SP TORSION A/C HEAD
3-19	MZ-B362281	HOLDER FE HEAD (2) PART
3-20	MR-364335	ROLLER IMPEDANCE
3-21	ZW-361458	PUSH WASHER 16X032X025PSL
3-22	ZS-460440	PAN20X04STL CMT
3-23	ZG-360604	SP TORSION HOLDER FE HEAD
3-24	BL-B360342-A	LEVER TENSION PART
3-25	BL-B360350	ARM TENSION BAND PART
3-26	ZG-321731	SP T2-04.0/0.40-25.0 T2-115
3-27	ZS-200614	SCREW TRIPLE PAN30X06
3-28	BV-V1047A080A	LOADING LEADER(R) BLK VS-112EG
3-29	BV-V1047A090A	LOADING LEADER(L) BLK VS-112EG
3-30	VT-360148-B	VERTICAL POLE PART
3-31	ZS-321729	6SET20X040SCM PKR WP
3-32	BL-B360486	LEVER FF BRAKE PART
3-33	ZG-364338-A	SP PULL FF BRAKE
3-34	ML-B364686-A	LEVER SUB BRAKE(R-2) PART
3-35	ZG-364339	SP PULL REW BRAKE
3-36	ML-B364685	LEVER BRAKE REVIEW(2) PART
3-37	ZG-364337	SP PULL REVIEW BRAKE
3-D1	ED-357540	D LED LN59
3-H901	HR-361454	HEAD COMBO HVMLA1004C
3-H902	HE-361456	HEAD E HVFMD0005B
3-SW1	ES-360433	SW LEAF MRX

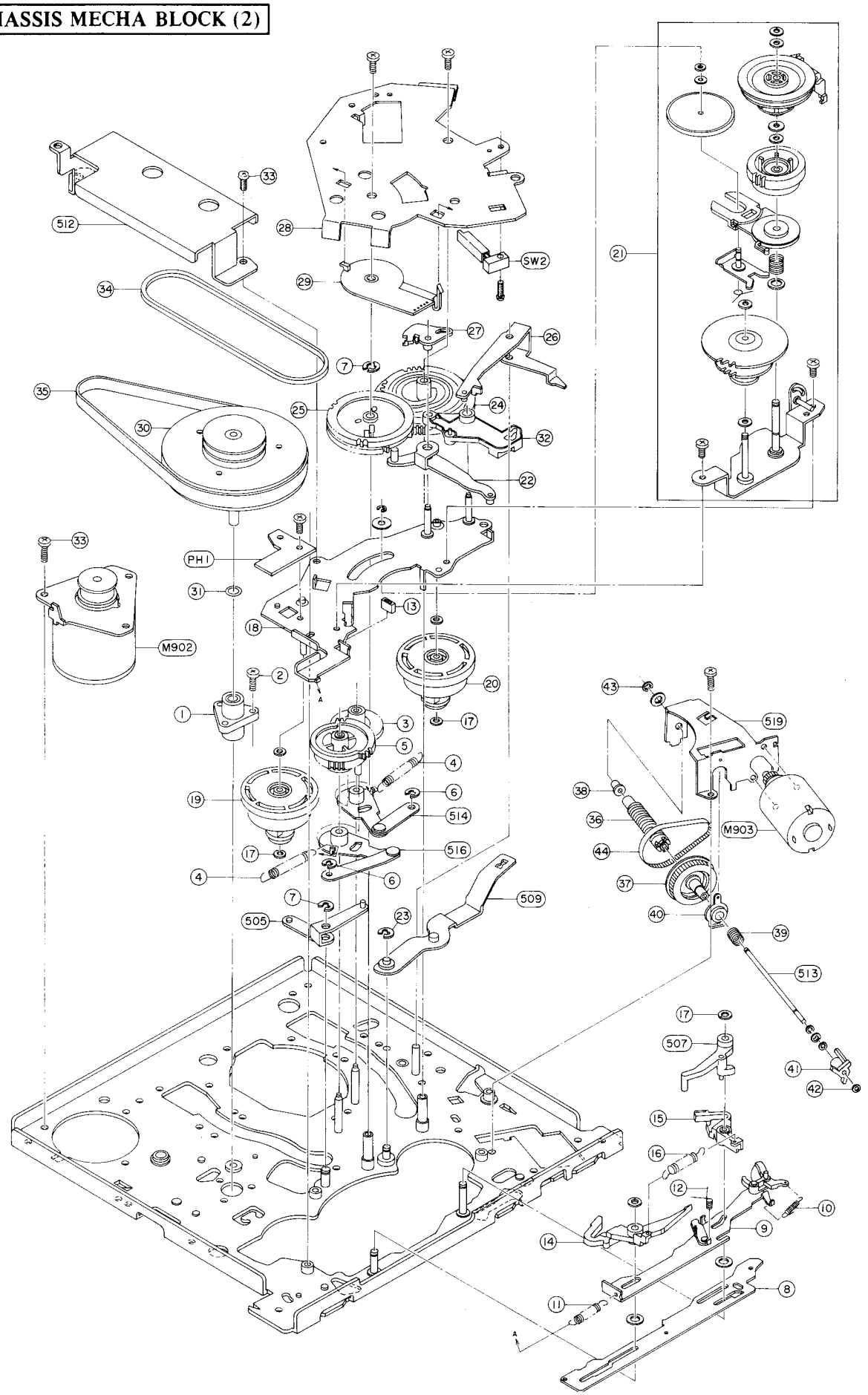
NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

4. CHASSIS MECHA BLOCK (2)

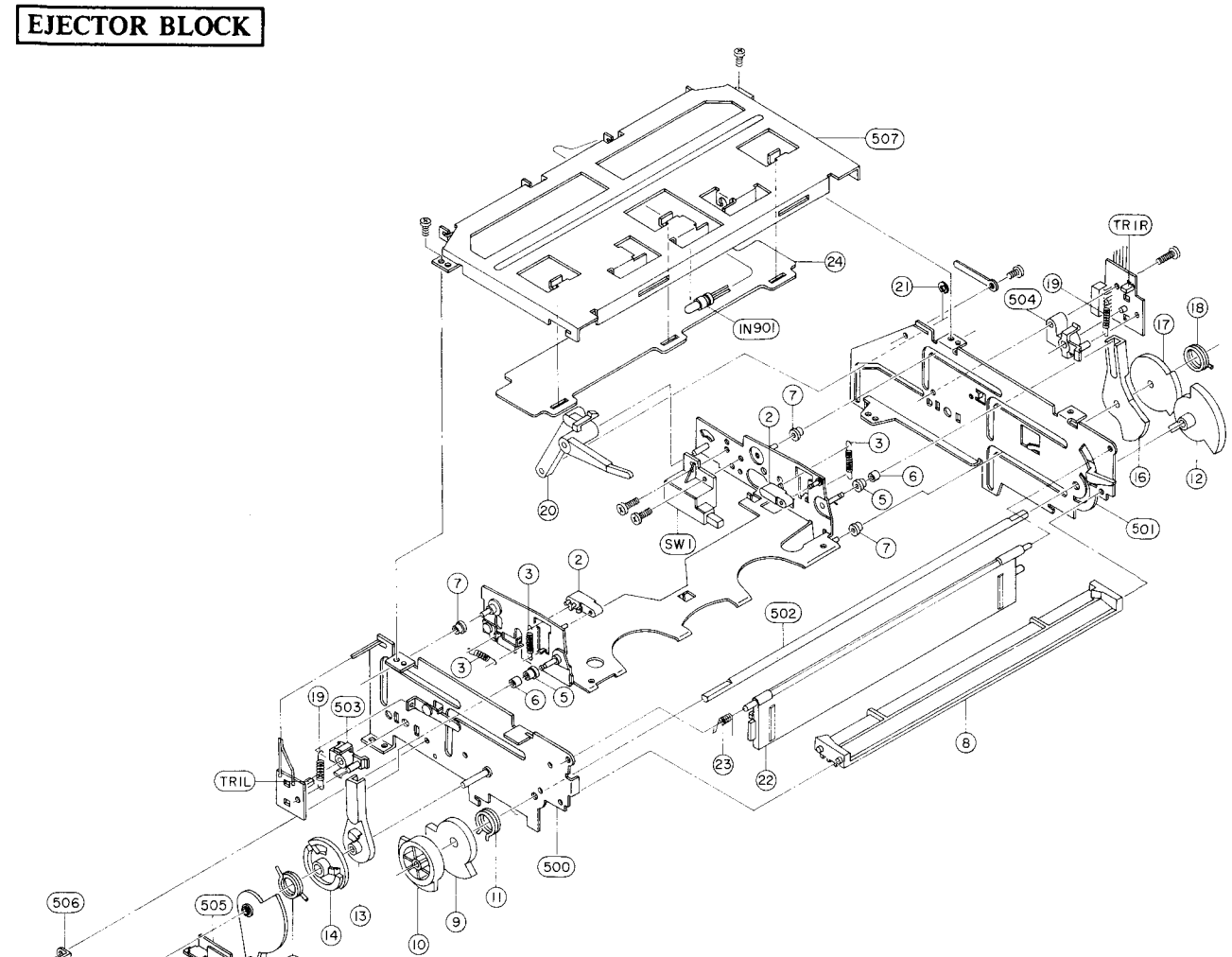
Ref. No.	Part No.	Description
4-1	MZ-B360528	HOLDER CAPSTAN PART
4-2	ZS-379350	PAN30X06STL CMT
4-3	MZ-360384	GEAR LOADING (S)
4-4	ZG-360601-A	SP PULL LOADING
4-5	MZ-360385-A	GEAR LOADING (T)
4-6	ZW-357164	RING E 230SUP CMT
4-7	ZW-270101	RING E 300SUP CMT
4-8	ML-366738	PLATE MAIN SLIDE(2)
4-9	MZ-B366734	PLATE F/R SLIDE (2)PART
4-10	ZG-358276	SP T6-03.2/0.20-12.5 T6-041
4-11	ZG-350891	SP T2-04.0/0.40-22.4 T2-114
4-12	ZG-360438	SP TORSION LIFTER
4-13	MB-366733	STOPPER SLIDE (2)
4-14	ML-B364684	ARM(TU) MAIM BRAKE(2) PART
4-15	ML-B364683	ARM(S) MAIN BRAKE(2) PART
4-16	ZG-366617	SP PULL MAIN BRAKE
4-17	ZW-360541	WASHER POLY SLIDER(3)
4-18	MZ-B360425-B	SUB FRAME PART
4-19	BR-B365715-B	TAKE-UP REEL TABLE PART 2
4-20	BR-B365716-B	SUPPLY REEL TABLE PART 2
4-21	MZ-366960	GEAR TU BLK (2)
4-22	ML-B360460-B	LEVER CAM SLIDE PART
4-23	ZW-410051	RETAINING RING E250SUP CMT
4-24	MZ-364677	GEAR CAM EJECT(2)
4-25	MZ-364676	GEAR CAM MAIN(2)
4-26	ML-B366735	LEVER CAM TENSION(2) PART
4-27	ML-366736	ARM SET FREE(2)
4-28	MZ-360477-B	PLATE MODE SW
4-29	VT-372187	ROTARY ENCORDER D2ZQ-R9-1
4-30	BF-B360531-B	FLYWHEEL CAPSTAN PART
4-31	ZW-360539	STOPPER OIL
4-32	ML-B366615-A	LEVER CAM F/R PART
4-33	ZS-379350	PAN30X06STL CMT
4-34	MB-360534	BELT IDLER
4-35	MB-360533	BELT PAL
4-36	MZ-360453	WORM GEAR
4-37	MR-364010	PULLEY WORM
4-38	ZW-360479-A	WASHER THRUST WORM
4-39	ZG-360441	SP TORSION ONE WAY
4-40	MZ-360440-A	HOLDER PULLEY WORM
4-41	MR-360432	PULLEY TRIGGER
4-42	ZW-361458	PUSH WASHER 16X032X025PSL
4-43	ZW-356657	RING E150SUP CMT
4-44	MB-364011	BELT SYNC NB930N15-020T
4-M902	BM-361544-B	MOTOR FG KCX-38FS5B
4-M903	BM-B361467	LOADING MOTOR PART
4-SW2	ES-361479	SW LEAF MSW-1594C
4-PH1	ET-361463	DETECTOR ON2170 Q,R

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

CHASSIS MECHA BLOCK (2)



EJECTOR BLOCK



5. EJECTOR BLOCK

Ref. No.	Part No.	Description
5-1	BB-V1047A250D	EJECTOR BLK VS-220U
5-2	ML-361316	ARM PRESSING
5-3	ZG-357865	SP T5-04.0/0.40-11.2 T5-108
5-4	MZ-B360642	GEAR EJECT PART
5-5	MR-361310	ROLLER (1)
5-6	MR-361311	ROLLER (2)
5-7	MR-361312	ROLLER (3)
5-8	SZ-360607	GUIDE
5-9	MZ-361314-A	GEAR (1)
5-10	MZ-361313	GEAR (3)
5-11	ZG-360615	SP TORSION (EJ)
5-12	MZ-360640-A	GEAR (2)
5-13	ML-360635	ARM LOADING (L)
5-14	MZ-360639	GEAR (4)
5-15	ZG-360614	SP TORSION (L)
5-16	ML-360634	ARM LOADING (R)
5-17	MZ-360638	GEAR (5)
5-18	ZG-360613	SP TORSION (R)

Ref. No.	Part No.	Description
5-19	ZG-358212	SP T5-06.3/0.50-16.0 T5-180
5-20	BL-B361308	ARM LID OPENER PART
5-21	ZW-357164	RING E 230SUP CMT
5-SW1	ES-353622-A	SW PUSH EVQ-WU7001 02-2
5-TR1L	ET-361490	TR PHOTO PN268 R,S
5-TR1R	ET-361490	TR PHOTO PN268 R,S
5-22	SE-361317R-A	MASK CASSETTE HQ
5-23	ZG-360616	SP TORSION

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

6. P.C BOARD BLOCK

Ref. No.	Part No.	Description
6-1	BA-V1069B300A	PC MAIN (PAL) BLK VS-220EV
6-2	BA-V1071A330B	PC OPERATION BLK VS-220EV
6-3	BA-V1071A400B	PC PRE AMP BLK VS-240

NOTE: PC MAIN BLK CONSISTS OF FOLLOWING P.C BOARD.

- MAIN P.C BOARD
- MAIN (VIDEO) P.C BOARD

7. MAIN P.C BOARD

Ref. No.	Part No.	Description
7-C304	EC-363490	C EC V CUT SME 222M 16.0DC
7-C308	EC-363489	C EC V CUT SME 221M 63.0DC
7-C309	EC-363491	C EC V CUT SME 222M 25.0DC
7-C310	EC-363491	C EC V CUT SME 222M 25.0DC
7-DL101	EH-371021	DL EFD-HR124A13J
7-D201	ED-344280	D SILICON H GMA-01-FY2 F05
7-D202	ED-362998	D ZENER H HZS9.1J B3 F05
7-D203	ED-344280	D SILICON H GMA-01-FY2 F05
7-D204	ED-344280	D SILICON H GMA-01-FY2 F05
7-D207	ED-337292	D ZENER H HZ5 B1
7-D208	ED-624903	D SILICON H 1S2473
7-D301	ED-367202	D SILICON S5566B F12
7-D302	ED-344280	D SILICON H GMA-01-FY2 F05
7-D303	ED-344280	D SILICON H GMA-01-FY2 F05
7-D304	ED-346582	D ZENER H HZ30L 1
7-D401	ED-370786	D ZENER H HZS9.1J B2 F05
7-D403	ED-361915	D ZENER H HZS8.2J B3 F05
7-D404	ED-344280	D SILICON H GMA-01-FY2 F05
7-D405	ED-344280	D SILICON H GMA-01-FY2 F05
7-D406	ED-344280	D SILICON H GMA-01-FY2 F05
7-D407	ED-344280	D SILICON H GMA-01-FY2 F05
7-D408	ED-344280	D SILICON H GMA-01-FY2 F05
7-D409	ED-344280	D SILICON H GMA-01-FY2 F05
7-D410	ED-344280	D SILICON H GMA-01-FY2 F05
7-D601	ED-367502	D ZENER H HZS9L A1 F05
7-D603	ED-344280	D SILICON H GMA-01-FY2 F05
7-D604	ED-344280	D SILICON H GMA-01-FY2 F05
7-FL501	EO-360647	COIL OSC 1 MX-102
7-FL551	EH-360339	FILTER LC AP AF-25P
7-FR233	*ER-360559	R FUSE H F12 RF50S 1/2W 1R0J
7-FR308	*ER-372129	R FUSE H S10 ERQ14LE 1/4W 2R2K
7-FR309	*ER-371796	R FUSE H S17 ERQ-12H 1/2W 1R0J
7-FR310	*ER-362256	R FUSE H S10 ERQ14LE 1/4W R47K
7-IC201	EI-360561	IC AN3792
7-IC202	EI-360560	IC MN6178XAL
7-IC203	EI-360563	IC AN3794
7-IC204	EI-367571	IC LA6358T
7-IC205	EI-367571	IC LA6358T
7-IC206	EI-360564	IC M54548L
7-IC301	EI-367571	IC LA6358T
7-IC302	EI-337530	IC UPC574J
7-IC401	EI-366681	IC MB88521-140M
7-IC402	*EI-353421	IC BA6229
7-IC403	EI-356811	IC M5224P
7-IC404	EI-360396	IC S-8054HN
7-IC405	EI-363347	IC TC9018P
7-IC501	EI-360648	IC BA5115
7-IC502	EI-358506	IC UPC1513HA
7-L501	EO-361913	COIL FIX 1 L-8 472J
7-L502	EO-370639	COIL FIX 1 L-8 272J
7-L551	EO-345881	COIL FIX 1 EL0606SKI 101J
7-L601	EO-345881	COIL FIX 1 EL0606SKI 101J
7-L602	EO-332105	COIL FIX 1 EL0606SKI 121J
7-L603	EO-345881	COIL FIX 1 EL0606SKI 101J
7-SF301	*EF-344106	FUSE ICP-N10 50V 0.4A
7-TR201	ET-353897	TR DTC114ES
7-TR202	ET-308472	TR 2SA1115 E,F,G F05
7-TR203	ET-360400	TR UN4210
7-TR204	ET-360400	TR UN4210
7-TR205	ET-354414	TR DTC144ES
7-TR301	ET-355669	TR 2SC3246 G,H,J F05
7-TR302	ET-371028	TR 2SD1266 P,Q
7-TR303	ET-352726	TR 2SA1392 T,U
7-TR304	ET-308977	TR 2SC2274K F F05
7-TR305	ET-360067	TR 2SC3330 T,U F05
7-TR306	ET-371028	TR 2SD1266 P,Q
7-TR307	ET-348948	TR 2SD1273 P,Q
7-TR308	ET-360067	TR 2SC3330 T,U F05
7-TR309	ET-356224	TR 2SA1286 G,H,J F05
7-TR310	ET-354094	TR DTC144WS
7-TR401	ET-354415	TR DTA144ES
7-TR404	ET-360400	TR UN4210
7-TR405	ET-360400	TR UN4210
7-TR406	ET-308472	TR 2SA1115 E,F,G F05
7-TR407	ET-308472	TR 2SA1115 E,F,G F05
7-TR408	ET-308472	TR 2SA1115 E,F,G F05
7-TR409	ET-354094	TR DTC144WS
7-TR502	ET-308141	TR 2SC2603 G F05
7-TR503	ET-354414	TR DTC144ES
7-TR551	ET-308472	TR 2SA1115 E,F,G F05
7-TR552	ET-308141	TR 2SC2603 G F05
7-TR553	ET-308141	TR 2SC2603 G F05
7-TR554	ET-308472	TR 2SA1115 E,F,G F05
7-TR555	ET-308141	TR 2SC2603 G F05
7-TR556	ET-308472	TR 2SA1115 E,F,G F05
7-TR557	ET-308472	TR 2SA1115 E,F,G F05
7-TR558	ET-308472	TR 2SA1115 E,F,G F05
7-TR601	ET-356336	TR DTA114ES
7-TR602	ET-356224	TR 2SA1286 G,H,J F05
7-TR603	ET-308141	TR 2SC2603 G F05
7-TR604	ET-308141	TR 2SC2603 G F05
7-TR605	ET-308141	TR 2SC2603 G F05
7-TR606	ET-308472	TR 2SA1115 E,F,G F05
7-TR607	ET-308472	TR 2SA1115 E,F,G F05
7-TR608	ET-308472	TR 2SA1115 E,F,G F05
7-TR610	ET-349882	TR 2SA1283 D,E F05 [EV]
7-VR201	EV-366436	R S-FIX H VM6CKPV31S 3P0.3W104
7-VR202	EV-356582	R S-FIX H RH0615CS4J 3P 473
7-VR301	EV-371696	R S-FIX H VM6CKPV31S 3P0.3W302
7-VR401	EV-363511	R S-FIX EVTK-4CA00BQ4 3P 473
7-VR501	EV-356577	R S-FIX H RH0615C14J 3P 103
7-VR502	EV-356582	R S-FIX H RH0615CS4J 3P 473
7-X401	EI-347991	OSC CE CSA6.00MS 6MHZ
7-J1	EJ-371029	PIN J YKC21-5210 YELLOW 2P [VIDEO]
7-J2	EJ-371030	PIN J YKC21-5187 BLACK 2P [AUDIO]
7-1A	BV-371162	RF CONV/BOOSTER EV [EV]
7-1B	BV-371157	RF CONV/BOOSTER MDLC3D553X [EG]
7-2	BV-V1069A900A	VIF FINAL BLK VS-240EG
7-3	EE-371416	TV TUNER TEMD1-004A EG
7-4A	SP-370064F	PANEL REAR EV
7-4B	SP-370064G	PANEL REAR EG

8. MAIN (VIDEO) P.C BOARD

Ref. No.	Part No.	Description
8-DL1	EH-360340-A	DL EFD-EN645A31P
8-D1	ED-344280	D SILICON H GMA-01-FY2 F05
8-D2	ED-344280	D SILICON H GMA-01-FY2 F05
8-D3	ED-344280	D SILICON H GMA-01-FY2 F05
8-D5	ED-344280	D SILICON H GMA-01-FY2 F05
8-D101	ED-344280	D SILICON H GMA-01-FY2 F05
8-D104	ED-624903	D SILICON H 1S2473
8-FL1	EH-373144	FILTER LC LP LF-69P-02 5P
8-FL101	EH-364045	FILTER LC FF-78P
8-FR1	*ER-348272	R FUSE H S10 ERD2FC 1/4W 12R0
8-IC1	EI-371023-A	IC HH3201P

Ref. No.	Part No.	Description
8-IC101	EI-370614	IC TA8604N
8-L1	EO-351865	COIL FIX 1 LAL02 F05 330J
8-L3	EO-351868	COIL FIX 1 LAL02 F05 470K
8-L5	EO-351869	COIL FIX 1 LAL02 F05 820K
8-L7	EO-354600	COIL FIX 1 LAL02 F05 101K
8-L8	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L9	EO-360555	COIL FIX 1 LAL02 F05 180K
8-L10	EO-360555	COIL FIX 1 LAL02 F05 180K
8-L11	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L12	EO-351868	COIL FIX 1 LAL02 F05 470K
8-L13	EO-356599	COIL FIX 1 LAL02 F05 270K
8-L14	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L15	EO-351869	COIL FIX 1 LAL02 F05 820K
8-L16	EO-357509	COIL FIX 1 LAL02 F05 181K
8-L17	EO-351863	COIL FIX 1 LAL02 F05 120J
8-L18	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L19	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L20	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L101	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L102	EO-360555	COIL FIX 1 LAL02 F05 180K
8-L104	EO-360555	COIL FIX 1 LAL02 F05 180K
8-L105	EO-345891	COIL FIX 1 EL0606SKI 391J
8-L107	EO-345889	COIL FIX 1 EL0606SKI 331J
8-L109	EO-353900	COIL FIX 1 LAL02 F05 150K
8-L110	EO-345881	COIL FIX 1 EL0606SKI 101J
8-L111	EO-356599	COIL FIX 1 LAL02 F05 270K
8-L114	EO-345881	COIL FIX 1 EL0606SKI 101J
8-SW101	ES-363102	SW SLIDE HSW0690-01-750 2-3
8-TR1	ET-308472	TR 2SA1115 E,F,G F05
8-TR2	ET-308141	TR 2SC2603 G F05
8-TR3	ET-354414	TR DTC144ES
8-TR9	ET-308141	TR 2SC2603 G F05
8-TR10	ET-308141	TR 2SC2603 G F05
8-TR12	ET-308141	TR 2SC2603 G F05
8-TR13	ET-308141	TR 2SC2603 G F05
8-TR14	ET-308472	TR 2SA1115 E,F,G F05
8-TR15	ET-356224	TR 2SA1286 G,H,J F05
8-TR16	ET-354365	TR DTC114YS
8-TR17	ET-354415	TR DTA144ES
8-TR19	ET-308141	TR 2SC2603 G F05
8-TR21	ET-308141	TR 2SC2603 G F05
8-TR101	ET-308141	TR 2SC2603 G F05
8-TR102	ET-308472	TR 2SA1115 E,F,G F05
8-TR103	ET-308141	TR 2SC2603 G F05
8-TR105	ET-308141	TR 2SC2603 G F05
8-TR106	ET-353897	TR DTC114ES
8-TR107	ET-308141	TR 2SC2603 G F05
8-TR108	ET-308141	TR 2SC2603 G F05
8-TR109	ET-308141	TR 2SC2603 G F05
8-TR111	ET-354415	TR DTA144ES
8-TR112	ET-308141	TR 2SC2603 G F05
8-VR1	EV-366845	R S-FIX V RVF8W01 3P 102
8-VR101	EV-366845	R S-FIX V RVF8W01 3P 102
8-VR102	EV-341251	R S-FIX V TM8KH1-1S 3P0.50W104
8-X1	EI-309878	OSC X'TAL 4.433619MHZ

Ref. No.	Part No.	Description
9-D936	ED-307572	D SILICON H 1SS131
9-D937	ED-307572	D SILICON H 1SS131
9-D938	ED-307572	D SILICON H 1SS131
9-D939	ED-307572	D SILICON H 1SS131
9-D940	ED-307572	D SILICON H 1SS131
9-D941	ED-307572	D SILICON H 1SS131
9-D942	ED-307572	D SILICON H 1SS131
9-D943	ED-307572	D SILICON H 1SS131
9-D944	ED-307572	D SILICON H 1SS131
9-D945	ED-307572	D SILICON H 1SS131
9-D946	ED-307572	D SILICON H 1SS131
9-D947	ED-307572	D SILICON H 1SS131
9-D948	ED-307572	D SILICON H 1SS131
9-D949	ED-307572	D SILICON H 1SS131
9-D950	ED-307572	D SILICON H 1SS131
9-D957	ED-307572	D SILICON H 1SS131
9-D958	ED-307572	D SILICON H 1SS131
9-D959	ED-307572	D SILICON H 1SS131
9-D960	ED-307572	D SILICON H 1SS131
9-D961	ED-307572	D SILICON H 1SS131
9-D962	ED-307572	D SILICON H 1SS131
9-D963	ED-307572	D SILICON H 1SS131
9-D964	ED-307572	D SILICON H 1SS131
9-D965	ED-307572	D SILICON H 1SS131
9-D973	ED-624903	D SILICON H 1S2473
9-D974	ED-360409	D PHOTO PN323B
9-IB901	EH-347743	COMP R RKC1/8B4 103J
9-IC901	EI-370727	IC MB88501-478M
9-IC902	EI-360404	IC M50450-011P
9-IC903	EI-367271	IC UPC1490HA
9-PM901	EE-360406	TUN-UNIT UBH02 8CH 203
9-SW901	ES-360408	SW SLIDE ESD-14187 1-01-02N
9-SW902	ES-349474	SW TACT SKHHAM004A
9-SW903	ES-349474	SW TACT SKHHAM004A
9-SW904	ES-349474	SW TACT SKHHAM004A
9-SW905	ES-349474	SW TACT SKHHAM004A
9-SW906	ES-349474	SW TACT SKHHAM004A
9-SW907	ES-349474	SW TACT SKHHAM004A
9-SW908	ES-349474	SW TACT SKHHAM004A
9-SW909	ES-349474	SW TACT SKHHAM004A
9-TR907	ET-308141	TR 2SC2603 G F05
9-TR908	ET-308141	TR 2SC2603 G F05
9-TR909	ET-308141	TR 2SC2603 G F05
9-TR910	ET-308141	TR 2SC2603 G F05
9-TR911	ET-308141	TR 2SC2603 G F05
9-TR912	ET-308141	TR 2SC2603 G F05
9-TR913	ET-308141	TR 2SC2603 G F05
9-TR914	ET-364060	TR DTC143ES
9-TR915	ET-308141	TR 2SC2603 G F05
9-TR916	ET-354415	TR DTA144ES
9-VR901	EV-356322	R S-FIX H KVSF637A 3P 502
9-VR902	EV-369716	VR ROTARY RK09K1130 B103
9-VR903	EV-369717	VR ROTARY RK09K1130 B104
9-X901	EI-356371	OSC X'TAL MS-309 4.194304MHZ

9. OPERATION (A) P.C BOARD

Ref. No.	Part No.	Description
9-D907	ED-356424	D LED BG5525S GREEN
9-D908	ED-356424	D LED BG5525S GREEN
9-D909	ED-356424	D LED BG5525S GREEN
9-D910	ED-356424	D LED BG5525S GREEN
9-D911	ED-356424	D LED BG5525S GREEN
9-D912	ED-356424	D LED BG5525S GREEN
9-D913	ED-356424	D LED BG5525S GREEN
9-D914	ED-356424	D LED BG5525S GREEN
9-D915	ED-356424	D LED BG5525S GREEN
9-D916	ED-355607	D LED PR5505S RED
9-D917	ED-355607	D LED PR5505S RED
9-D918	ED-355607	D LED PR5505S RED
9-D921	ED-355607	D LED PR5505S RED
9-D934	ED-307572	D SILICON H 1SS131
9-D935	ED-307572	D SILICON H 1SS131

10. TRANS. P.C BOARD

Ref. No.	Part No.	Description
10-C701	*EC-369818	C CE V CS17FZ 103Z 400AC
10-D701	*ED-371397	D SILICON DSF10T-FA6 F10
10-D702	*ED-371397	D SILICON DSF10T-FA6 F10
10-D703	*ED-371397	D SILICON DSF10T-FA6 F10
10-D704	*ED-371397	D SILICON DSF10T-FA6 F10
10-D705	*ED-371398	D SILICON DSA17-FB8 F12
10-D706	*ED-371398	D SILICON DSA17-FB8 F12
10-D707	*ED-371398	D SILICON DSA17-FB8 F12
10-D708	*ED-371398	D SILICON DSA17-FB8 F12
10-F1	*EF-258344	FUSE SEMKO T 250V 800MA
10-F2	*EF-623103	FUSE SEMKO T 250V 1.00A
10-FR701	*ER-362257	R FUSE H S17 ERQ-12H 1/2W 47K
10-T1	*BT-373316	TRANS POWER V69L-EV
10-SW701	*ES-354430	SW SLIDE 00220950 02-02-2N
10-1	*EW-371933	AC CORD 200 KP419LTCE B10(A

FINAL ASSEMBLY BLOCK

11. PRE-AMP P.C BOARD

Ref. No.	Part No.	Description
11-IC801	EI-352714	IC HA11752
11-L801	EO-357508	COIL FIX 1 LAL02 F05 151K
11-L802	EO-353902	COIL FIX 1 LAL02 F05 680K
11-L803	EO-345881	COIL FIX 1 EL0606SKI 101J
11-L804	EO-345881	COIL FIX 1 EL0606SKI 101J
11-TR801	ET-308141	TR 2SC2603 G F05
11-TR802	ET-338565	TR 2SD1302 R,S
11-TR803	ET-372080	TR 2SD1330 S,T
11-TR804	ET-372080	TR 2SD1330 S,T

12. FINAL ASSEMBLY BLOCK

Ref. No.	Part No.	Description
12-1	BD-V1071A135A	PANEL FRONT BLK VS-220EV
12-1-B	BD-V1071B135A	PANEL FRONT BLK VS-220EV-B
12-2	SA-353927B	FOOT(2)
12-3	SP-369714A-B	COVER UPPER
12-3-B	SP-369714B-B	COVER UPPER-B
12-4	ZS-362378	PLX BID30X10STL CMT
12-5	ZS-365301	PLX PAN30X10STL NI3
12-5-B	ZS-359125	PLX PAN30X10STL BNI

SYMBOL FOR COLOR VARIATION

NON : SILVER
B : BLACK

13. ACCESSORY

Ref. No.	Part No.	Description
13-1	EW-348414	CORD PAL
13-2	AV-361336	DRIVER

14. REMOTE CONTROL UNIT RC-V220

Ref. No.	Part No.	Description
14-1	AV-370539	REMOCON RC-V220A-E WIRELESS(T
14-1-B	AV-370540	REMOCON RC-V220A-EB
14-D1	ED-705414	D LED SE303A INFRARED
14-IC1	EI-719456	IC TC9012F-172
14-Q1	ET-719455	TR 2SD1469
14-X1	EI-710044	OSC CE CSB455EB 455KHZ
14-2	SC-719457	COVER BATTERY RC-V220-S
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AV-370539	14-1	ED-344280	7-D404	EH-373144	38	EO-356599	8-L13
AV-370540	14-1-B	ED-344280	7-D405	EH-373144	8-FL1	EO-356599	8-L111
BA-V1069B300A	6-1	ED-344280	7-D406	EI-309878	62	EO-357508	11-L801
BA-V1071A330B	6-2	ED-344280	7-D407	EI-309878	8-X1	EO-357509	8-L16
BA-V1071A400B	6-3	ED-344280	7-D408	EI-337530	58	EO-360555	8-L9
BB-V1047A250D	5-1	ED-344280	7-D409	EI-337530	7-IC302	EO-360555	8-L10
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BD-V1071B135A	12-1-B	ED-344280	7-D603	EI-347991	7-X401	EO-360555	8-L104
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BR-B365716-B	4-20	ED-356424	9-D911	EI-360563	40	ES-349474	9-SW904
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ABBREVIATIONS (VIDEO)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AC	Alternating Current	LM STP	Loading Motor SToP
ACC	Auto Color Control	LP	Long Play
A/C	Audio and Control	LPF	Low Pass Filter
ADJ	ADJust(ment)	LSW	Loading SWitch
AFC	Auto Frequency Control	ME-SECAM	Middle East SECAM
AFT	Auto Fine Tuning	MI-COM	MIcro COMputer
AGC	Auto Gain Control	MM	Mono-stayble Multi
AH(P)	Audio Head (Play Back)	MRS	Motor ReverSe
AH(R)	Audio Head (Record)	NG	Noise Gate
AL	ALl	NON-LIN	NON-LINear
AL	ALways	N.T.S.C.	National Television System Committee
ALC	Auto Level Control	O MUTE	Output MUTE
A-SW·P	Audio-SWitching·Pulse	OSC	OSCillator
A·MUTE	Audio·MUTE	PAL	Phase Alternation Line
AUT/MAN	AUTO/MANual	PB	Play Back
ANT	ANTenna	P-COM	Phase-COMparator
APC	Automatic Phase Control	PDN	Power DowN
ASSY	ASSemblY	PG	Pulse Generator
BAL	BALance	PL, PLG	PLunger (PLunGer)
B/C	Buzz and Charactor	POS	POSition
B DOWN	Break DOWN	PRG	PRoGram
BGP	Burst Gate Pulse	P & S	Power supply & System control
BLK	BLacK or BLock	PU	Pick Up (head, pulse)
BM	Balanced Modulator	PWR	PoWeR
BPF	Band Pass Filter	Q	Quality factor
BS	Band Select	RC	Rotary Control
BS (SB)	Brake Supply (Supply Brake)	REC	RECord
BT (TB)	Brake Takeup (Takeup Brake)	REF	REFerence
BU	Back Up	REF-V	REFerence Vertical signal
B/W	Black and White	REG	REGulator
CCIR	Comité Consultatif International des Radio Communications	REV (REVW)	REView (REVieW)
		REW	REWind
CH (Ch.)	CHannel (Channel)	RFB	Radio Frequency Booster
CK	Color Killer	RM	Reel Motor
CLK	CLocK	RM PWR	Reel Motor PoWeR
CLP	CLiP	R·S SW	Record·Safety SWitch
CM	Capstan Motor	RST (RES)	ReSeT (RESet)
CN	CoNnector	RVS	ReVerSe
COMP	COMParator	S	Sensor, Shield
Comp	Comparison	SC	SimulCast
C or R	Cue or Review	S CLK	Serial CLocK
CR 1	Cue Review 1 (high)	S & A	Servo & Audio
CSW	Cassette SWitch	SECAM	Séquentiel à Memoire
CTL	ConTroL	SEP (SEPA)	SEParator (SEPArator)
CUE	CUE	SFP	Sync Front Pulse
CW	Carrier Wave	S & H	Sample and Hold
DAC	Digital to Analog Converter	SLP	Super Long Play
DC	Direct Current	SP	Standard Play
DEMOD	DEMODulator	SPD	SPeeD
DET	DETect (DETector)	SRP	Supply Reel Pulse
DL	Delay Line	SRV	SeRVo
DM	Drum Motor	SOW	Sync On Word
DOC	Drop Out Compensator	STBY	STandBY
D·P·E	Drum·Phase·Error	SW	SWitch
D·PG	Drum·Pulse Generator	SW'NG	SWitchiNG
D·TPZ	Drum·TraPeZoid	SWP	SWitching Pulse
EE	Electronic to Electronic	SYNC	SYNChronize
EF	Emitter Follower	T-AUDIO	Tuner AUDIO
EM	Eject Motor	TA-MUTE	Tuner Audio MUTE
EMPHA	EMPHAsis	TPZ (TRAPE)	TraPeZoid (TRAPEzoid)
ENVIN	ENVelope INput	TRK	TRacKing
ESW	Eject SWitch	TRP	Take up Reel Pulse
EQ	EQualizer	T/U	Take Up
FE	Full track Erase	TV	TeleVision
FF	Flip-Flop	UHF	Ultra High Frequency
FG	Frequency Generator	UNR	UNRegulated
Fig.	Figure	V	Vertical
FM	Frequency Modulation	VCO	Voltage Controlled Oscillator
Fo	resonance Frequency	VD	Vertical Drive
FREQ	FREQuency	VF	Voltage for Fine tuning
FSI	Field Start Inhibit	VHF	Very High Frequency
GND	GrouND	VHS	Video Home System
H	Horizontal	VID	VIDeo
HP	Horizontal (sync) Pulse	VIDEO-J	VIDEO Judge
HPF	High Pass Filter	VIF	Video Intermediate Frequency
HT	HeaTer	VJ	Video Judge
IC	Integrated Circuit	VM	Voltage for Memory
ID	IDentification	VOB	Video On Blank
IDL	IDLe (Voltage)	VOW	Video On Word
INS	INSert	VP	Vertical (sync) Pulse
INV	INVerter	VT	Voltage for Tuning
L·CTL	Lamp·ConTroL	WHT	WHiTe
LED	Light Emitting Diode	2H	2 Hour (SP)
LDI	LoaD Input	6H	6 Hour (SLP)
LM	Loading Motor		

AKAI

MODEL VS-220EV

SCHEMATIC DIAGRAM AND PC BOARDS

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6. VIDEO BLOCK DIAGRAM..... 9
7. CONNECTION DIAGRAM..... 10
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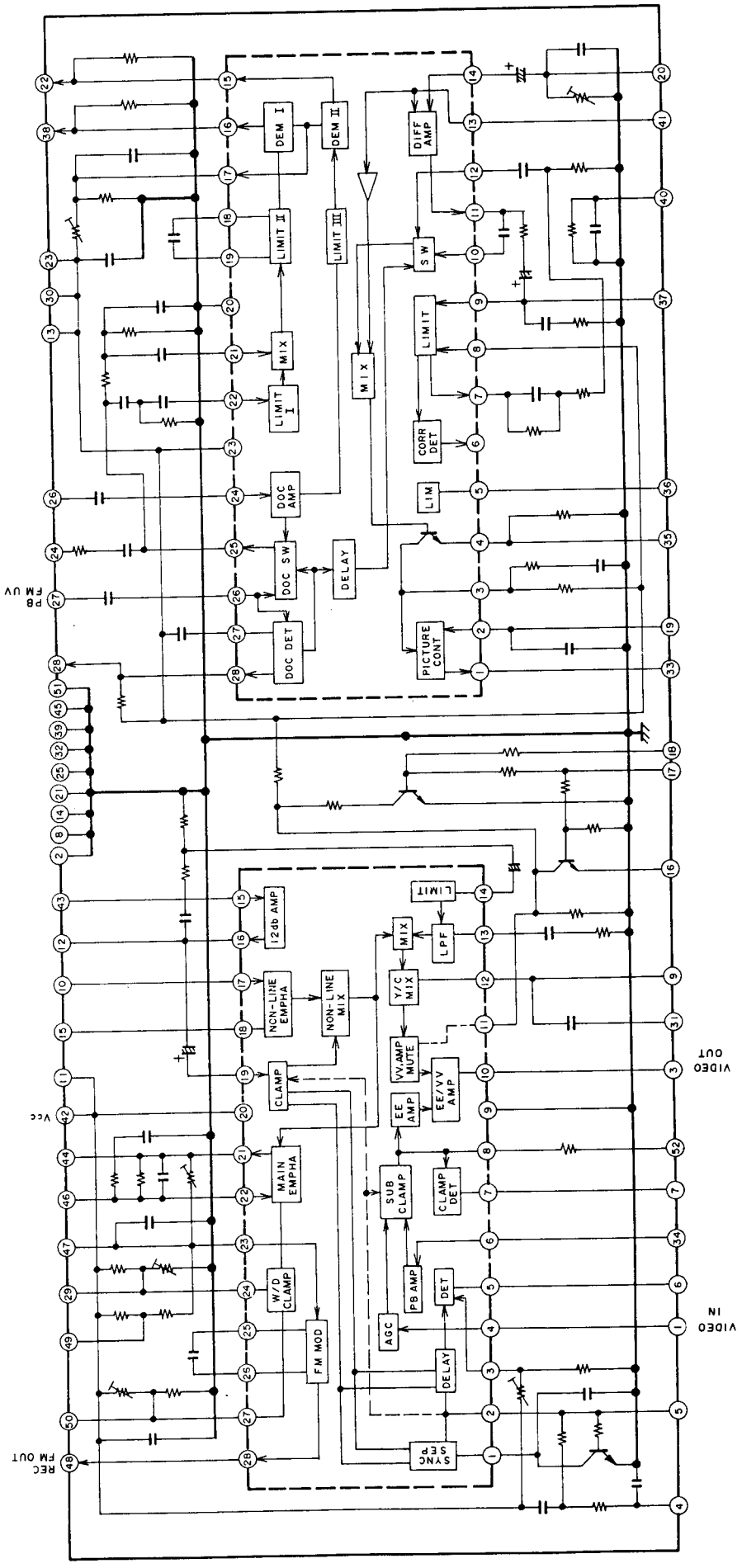
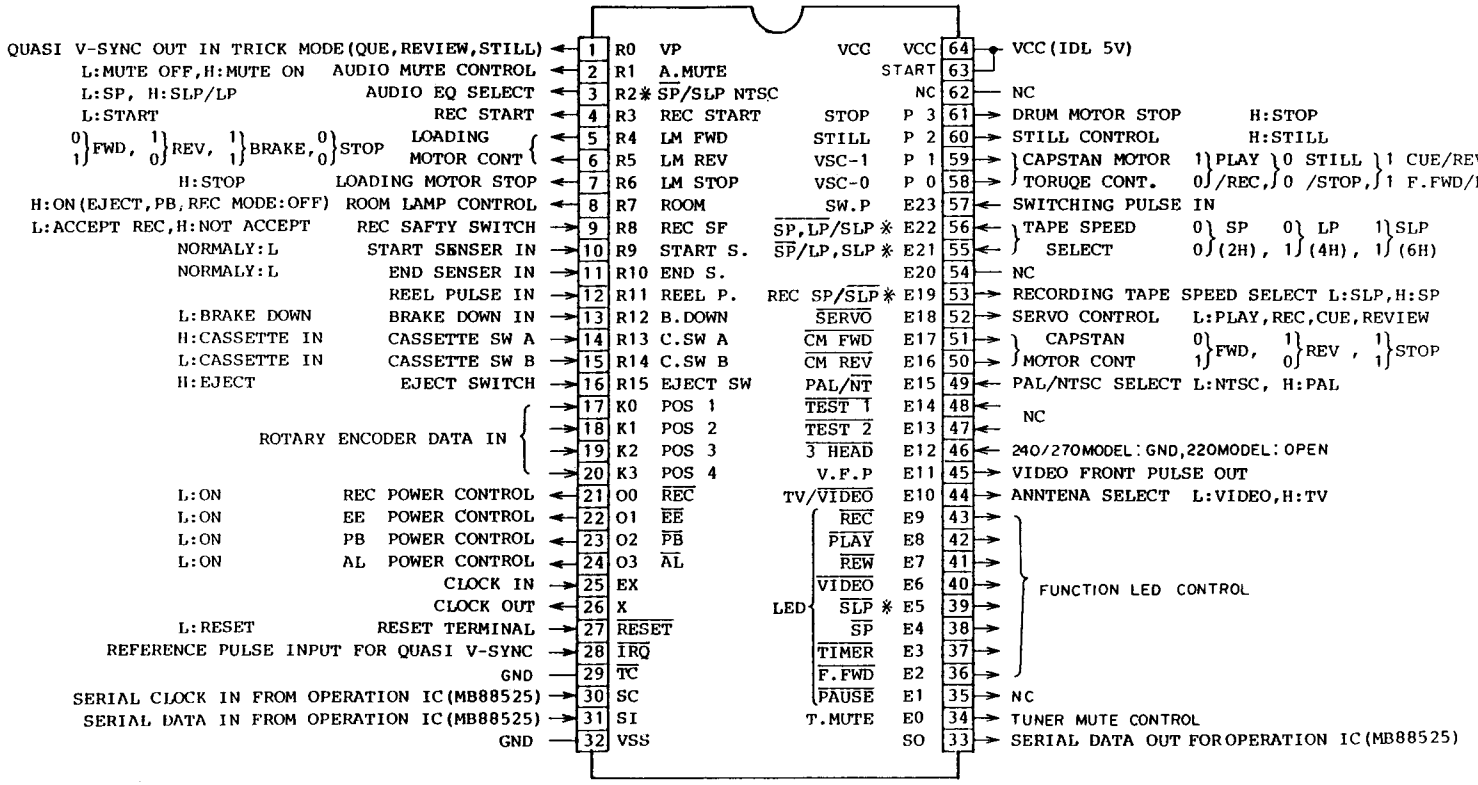
12. OPERATION PC BOARD 15
13. RC-V220A REMOTE CONTROL SCHEMATIC DIAGRAM..... 16

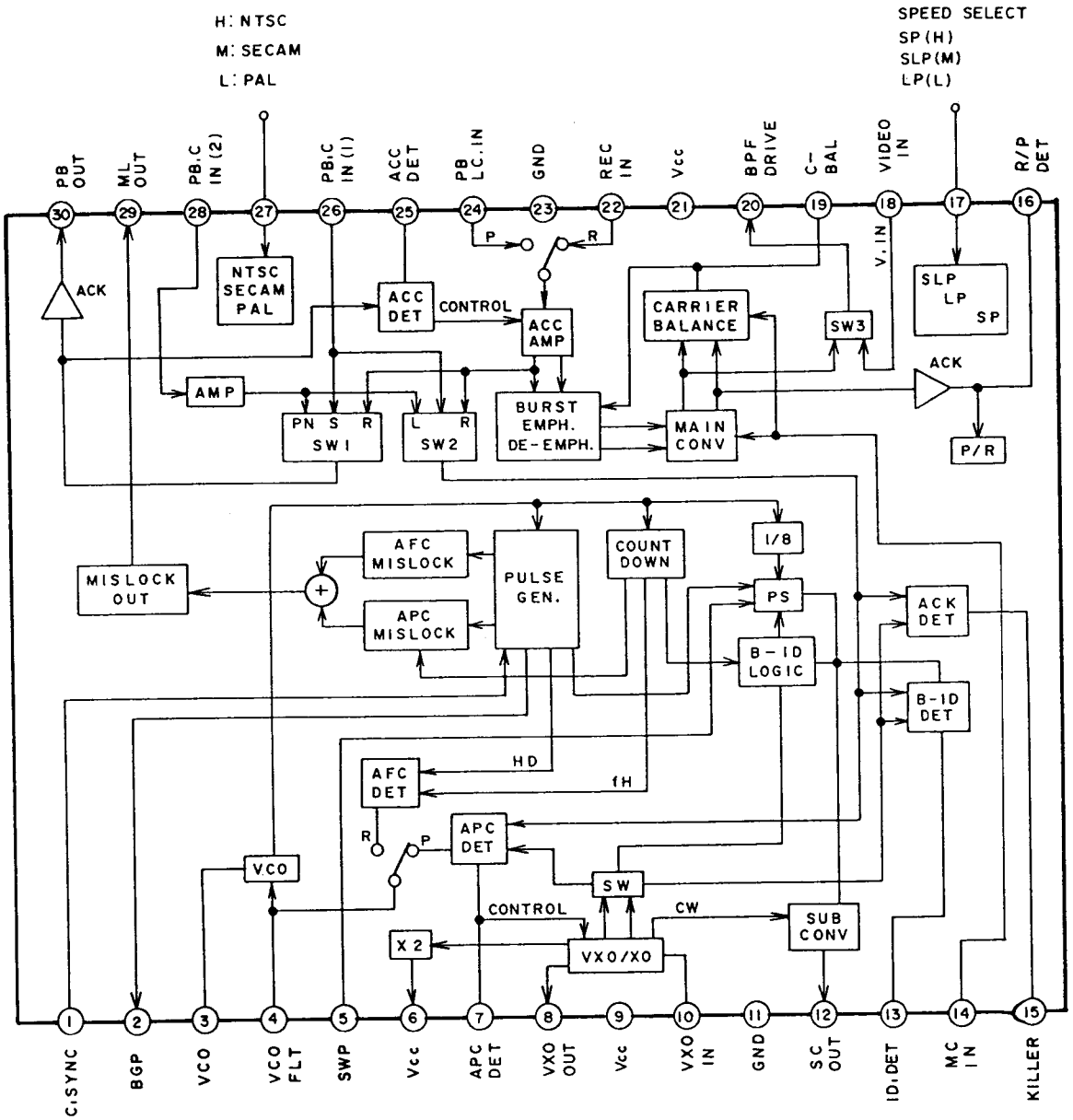
EHM-M96A8U63K-2 (VIDEO Y. SIGNAL PROCCESSING IC)

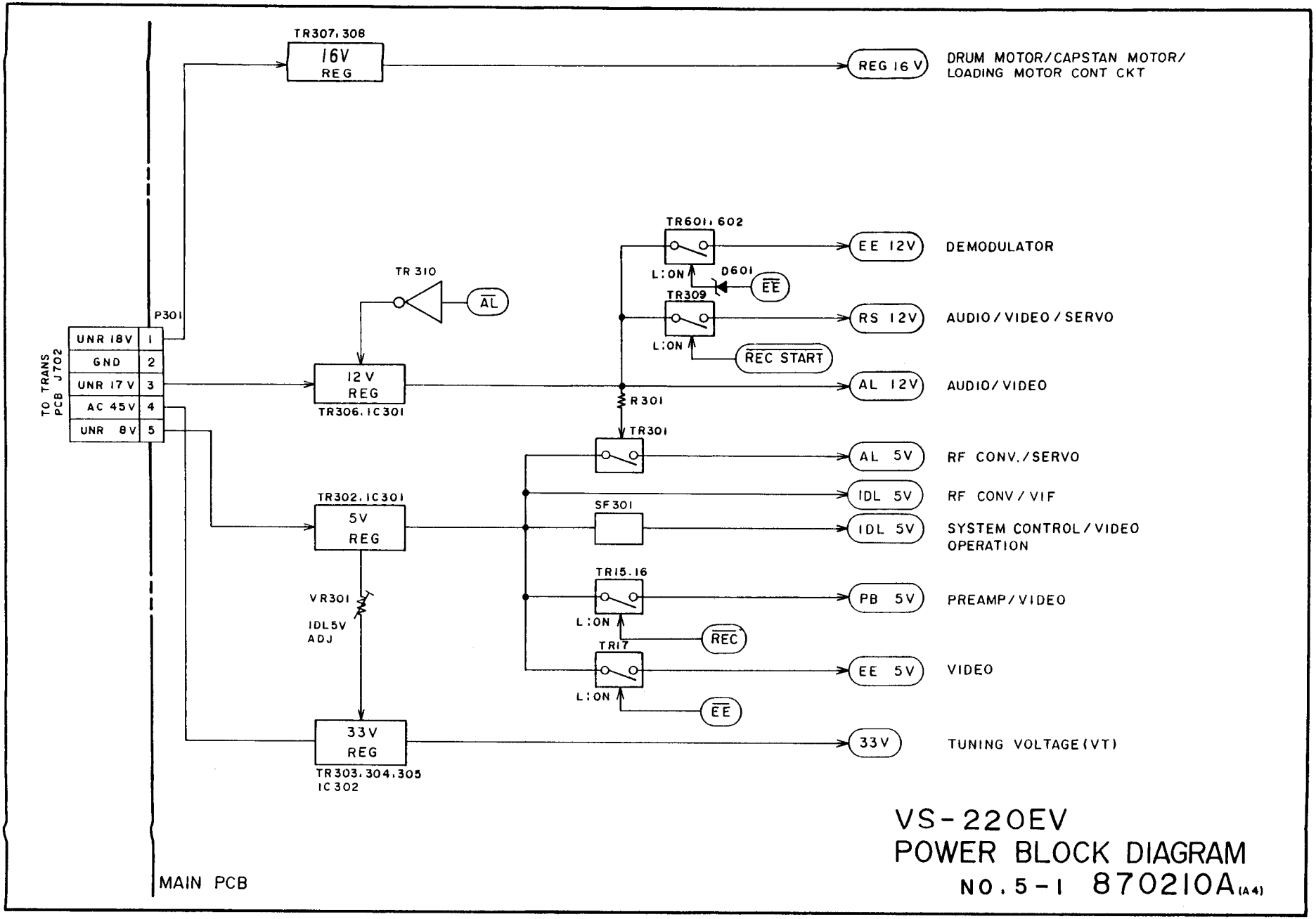




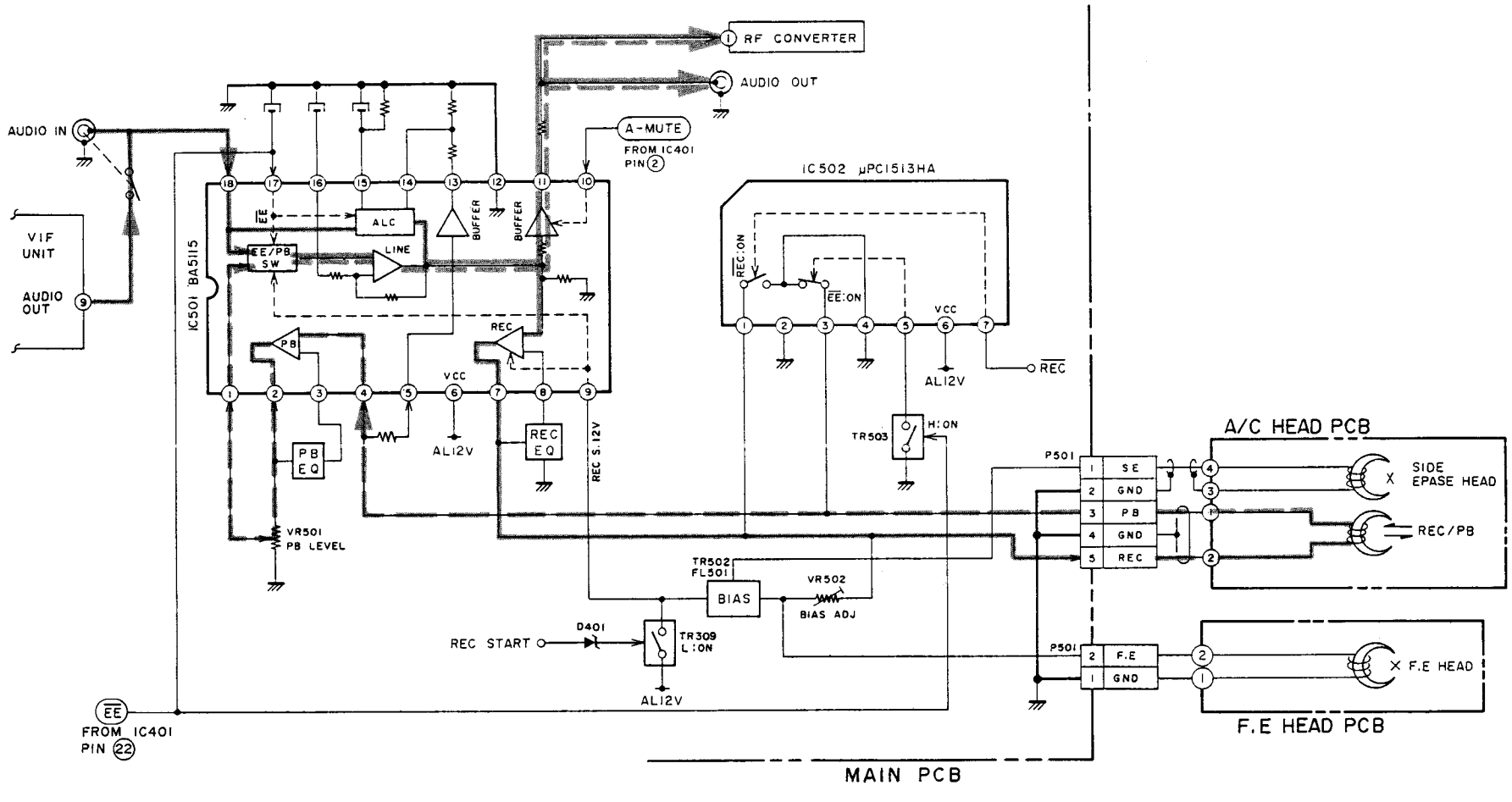
※ = NTSC MODEL ONLY

TA8604N (CHROMA SIGNAL PROCESSING IC)





VS-220EV
POWER BLOCK DIAGRAM
NO. 5-1 870210A (A4)



VS-220EV
AUDIO
BLOCK DIAGRAM
NO.5-2 870225A

IC902 M50450-011P
(TV DISPLAY CONTROL)

R4 to R7
DISPLAY DATA

KEY SCAN
TIMING OUT

OPERATION KEY

KEY INPUT

REMOCON AMP
IC903 μPC1490HA

IC901 MB88501-478M
OPERATION MPU

8 CHANNEL
CHANNEL SELECTOR

CH LED

POTENTION METER

SW1

MODE LED

D915 PLAY

D916 REC

TIMER

D918

X901
4.1943 MHz

IC404

QUASI V SYNC CIRCUIT

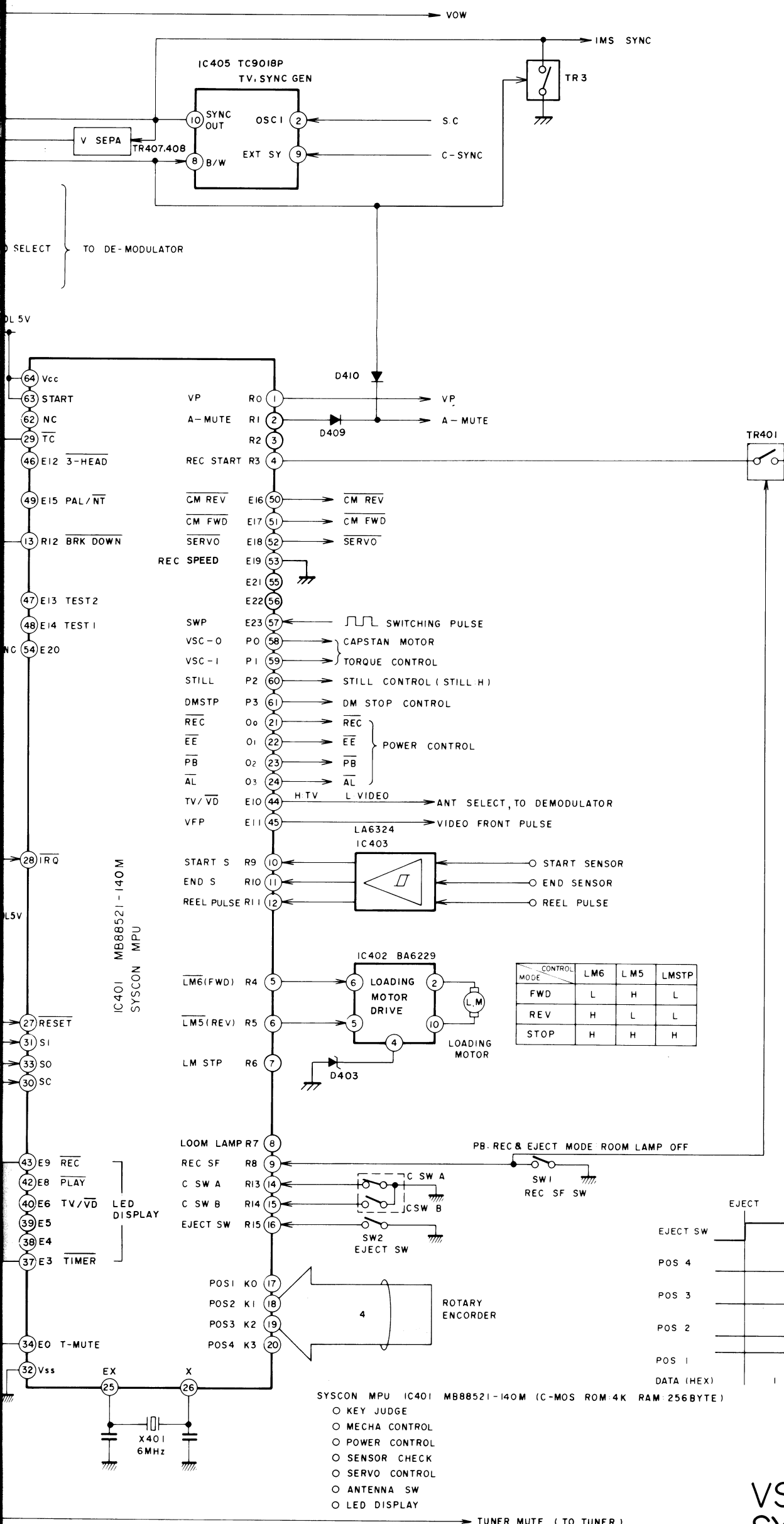
TR404, 405, 406,
IC403 D404, 405

OPERATION MPU

IC901 MB88501-478M (C-MOS ROM 4K RAM 192 BYTE)

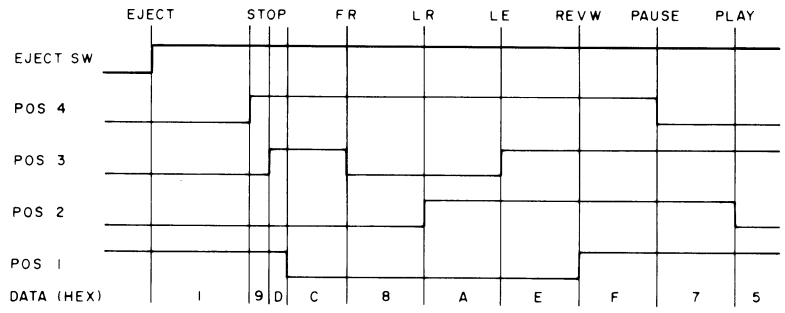
- KEY SCAN/JUDGE
- IR REMOCON DECODE
- CLOCK/TIMER CONTROL
- IMS CONTROL & TV DISPLAY CONTROL
- TUNER CONTROL

OPERATION PCB ⇐ ⇒ MAIN PCB



MODE \ CONTROL	LM6	LM5	LMSTP
FWD	L	H	L
REV	H	L	L
STOP	H	H	H

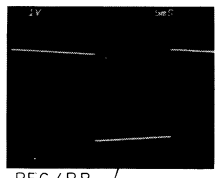
ROTARY ENCODE DATE



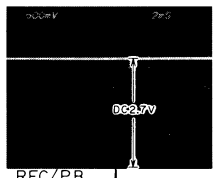
VS-220EV
SYSTEM BLOCK DIAGRAM
NO.5-3 870203A

DM FG
REC/PB
fsc
REC/PB
DM PG
PB
V SYNC
REC/PB
SWITCHING PULSE
REC/PB
③ CM PHASE
② CM SPEED
REC/PB
⑫ DM PHASE
⑬ DM SPEED
REC/PB
V S
REC/PB
DM FG
REC/PB
TRACKING
REC/PB
CTL
PB
CM FG
REC/PB
CTL
REC
CTL AMP OUT
PB
DRUM MOTOR BLOCK SM-240
REG 16V
IC 1 BA6413 DRUM MOTOR DRIVER
CONT. AMP
φ1 HALL AMP
φ2 HALL AMP
φ1 AMP & DRIVER
φ2 AMP & DRIVER
GND
HD 1
HD 2
AL 5V
L2
12 POLES
PG
FG
TR 1
IC 2
P1
P201
P GND
REG 16V
DM PG
GND
AL 5V
DM CTL
DM FG
OPERATION PCB
AL 5V
EXT TRACKING
VR902
P953
TRK
P407
TRACKING PRESET
VR202
CTL HEAD
P202
CTL
GND
CTL GND
CAPSTAN MOTOR
P203
FG +
CM +
CM −
FG −
IC205 LA6358
A
IC 1 BA6413 DRUM MOTOR DRIVER
VR201
PB SWITCHING POINT
AL 5V
IC201(1/2) AN3792 (DRUM INTERFACE)
FF-1.2 1/3
MM
FF3 1/2
LPF
R20' C201
SWITCHING PULSE
SWP
"V SYNC" FROM TR19 CORRECTOR
FP3 FSC
"fsc" FROM IC101 PIN (8)
REF PULSE GEN
REF PULSE
"REC START 12V" FROM TR309 CORRECTOR
D207 HZ5-B1
R212
IC204 (2/2)
REG 16V
IC201(2/2)
TR MM
REC CTL
CTL AMP
CTL GND
IC202 MN6178XAL (DIGITAL SERVO)
Vcc
MODE GENERATOR
MODE
TEST
Vss
PB
SLOW
DM TIMING CONT
PHASE COMP
PWM (D/A)
DM PHASE ERROR
DM FG
TRACKING SIGNAL
DM SPEED ERROR
P.B
REC
REF OSC
CTL PULSE
CTL COUNT DOWN
CM TIMING CONT
PG COUNT DOWN
REF PULSE
CAPSTAN FG
FG COUNT DOWN
1/2
V SYNC 2 OUT
R214.215 C211.212
CM SPEED ERROR
R213
R220, C215, 216
PHASE COMPENSATOR
R216
CM PHASE ERROR
R218, 219 C213, 214
P242
REF VOLTAGE
IC205 M5223L
TR203
TR205
STILL : ON
D204
STILL
SERVO
IC203 AN3794 (CAPSTAN INTERFACE)
CM FG
CTL
I/M
I/N
COUNTER
OUTPUT SELECTOR
GAIN SELECT
"VSC 1" FROM IC401 PIN (59)
R246
R243
R244
R245
C239
TR204
D203
CURRENT LIMIT
IC206 M54548L (CAPSTAN MOTOR DRIVE)
R269
C251
R267
R265
R266
D202
MODE DET
MOTOR DRIVE
S3
S2
S1
O2
O1
CM(−)
CM(+)
DRUM MOTOR SPEED
DRUM MOTOR PHASE
DRUM MOTOR CONTROL
CAPSTAN MOTOR SPEED
CAPSTAN MOTOR PHASE
CAPSTAN MOTOR CONTROL
REC / PB
CM FG
REC/PB
DC2.7V
REC/PB
DC2.7V

V SYNC 2



REC/PB



REC/PB

R212
REC START 12V — FROM TR309 CORRECTOR
PB — FROM IC401 PIN (23)
CM FWD — FROM IC401 PIN (51)
VSC 1 — FROM IC401 PIN (59)
VSC 0 — FROM IC401 PIN (58)

C228
R231
DM PHASE ERROR → LPF → PHASE COMPENSATOR C223, 224, R226
DM SPEED ERROR → LPF
MIX
IC204 LA6358
TR201
"DM STOP" FROM IC401 PIN (61)
H: DM STOP

V SYNC 2 OUT
M SPEED ERROR
M PHASE ERROR

"STILL" FROM IC401 PIN (60)

206 M54548L
AN MOTOR DRIVE)
MODE DET
S3 (10) "CM REV" FROM IC401 PIN (50)
S2 (11) "CM FWD" FROM IC401 PIN (51)
S1 (12) "SERVO" FROM IC401 PIN (52)
O2 CM(−)
O1 CM(+)
VS
MOTOR DRIVE

TRUTH TABLE

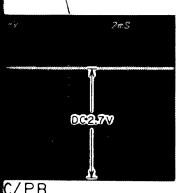
INPUT			OUTPUT		VCC SELECT	MODE
S1	S2	S3	O_1	O_2		
L	L	L	"OFF" STATE	"OFF" STATE	—	STOP
L	L	H	H	L	VS	PLAY ⊕
L	H	L	L	H	VS	PLAY ⊖
L	H	H	H	L	V2	F.FWD(2)
H	L	L	L	H	V2	REW(2)
H	L	H	H	L	V1	F.FWD(1)
H	H	L	L	H	V1	REW(1)
H	H	H	L	L	VS	BRAKE

SYSCON CPU
IC401
MB88521-140M

(2) A MUTE
(4) REC START
(21) REC
(23) PB
(50) CM REV
(51) CM FWD
(52) SERVO
(57) SWITCHING PULSE
(58) VSC 0
(59) VSC 1
(60) STILL
(61) DM

TERMINAL / MODE	(51) CM FWD	(50) CM REV
FWD	L	H
REV	H	L
STOP	H	H

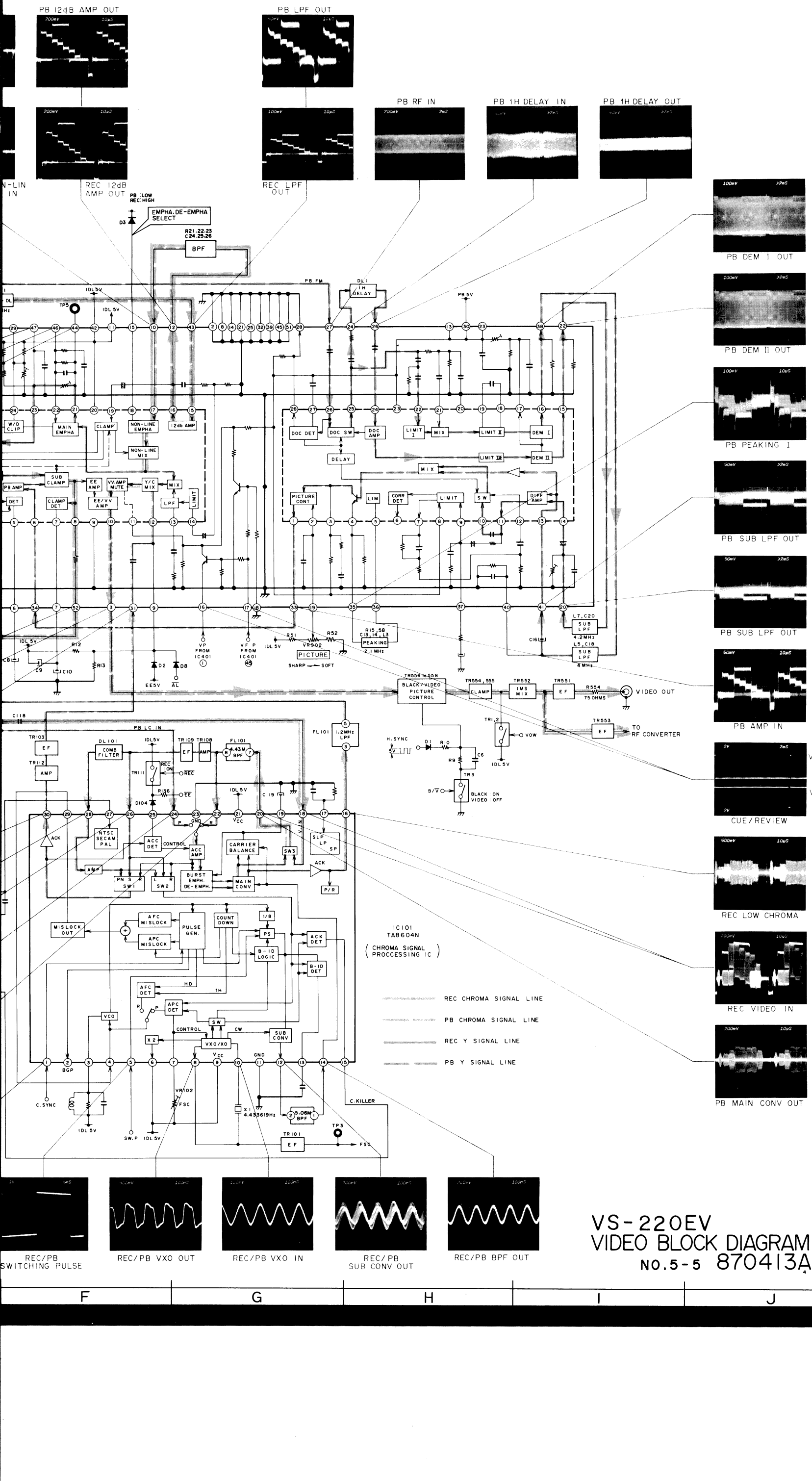
CONTROL / MODE	VSC-0	VSC-1	SERVO	CM FWD	CM REV
PLAY	H	L	L	L	H
CUE	H	H	L	L	H
REVIEW	H	H	L	H	L
STILL	H	H	H	H	H
F. FWD	H	H	H	L	H
REW	H	H	H	H	L



C/PB

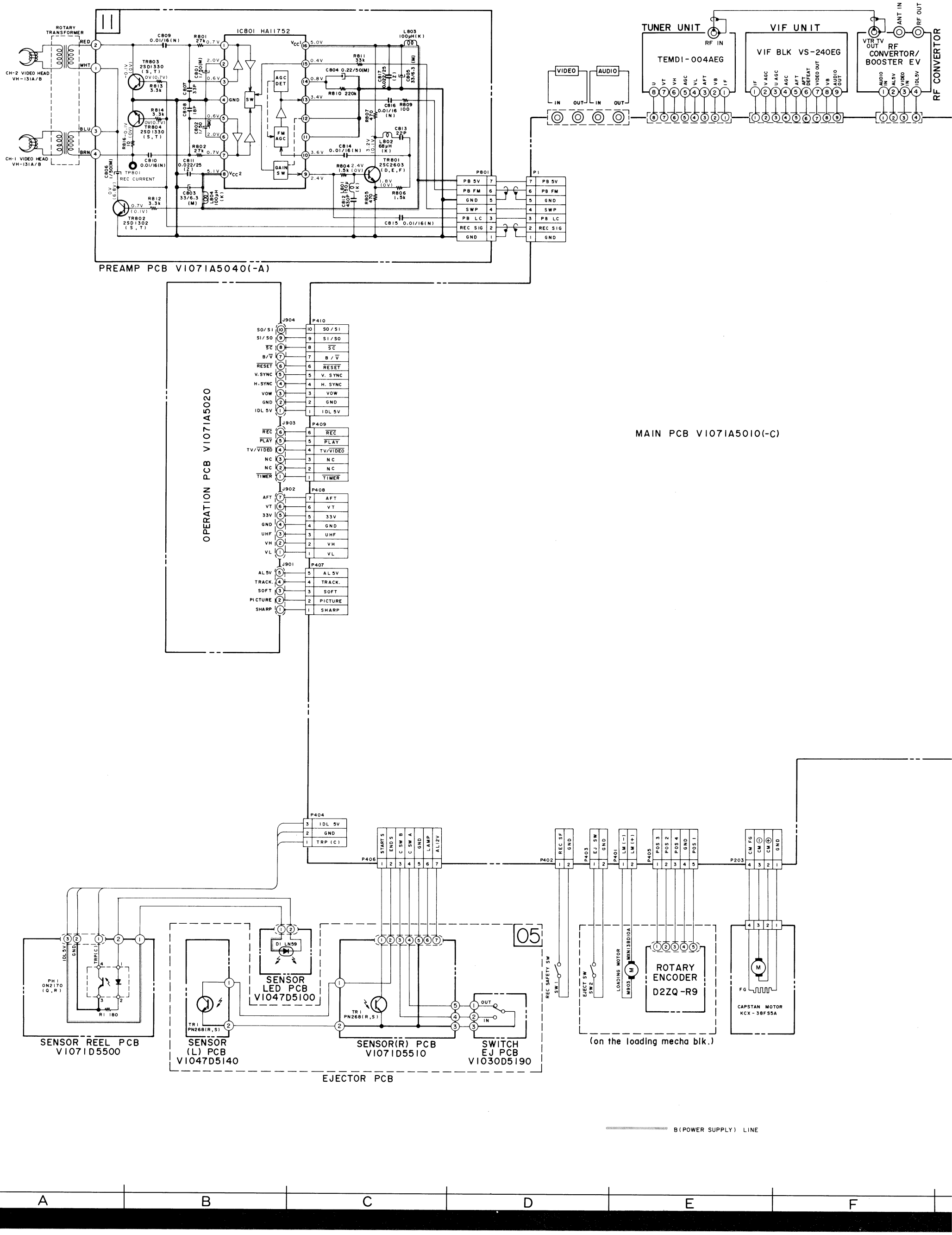
VS-220EV
SERVO BLOCK DIAGRAM
NO.5-4 870412A

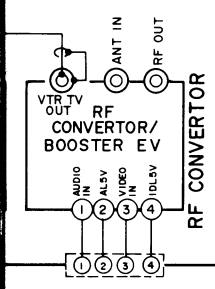
PB NON-LIN DE-EMPHA IN
PB 12dB AMP OUT
REC RF SIG
REC FM MOD OUT
PB PEAKING AMP OUT
REC NON-LIN EMPHA IN
REC 12d AMP OUT
IC801 HA11752
ROTARY TRANSFORMER
CH 2
CH 1
TR803
TR804
TR802
REC ON
PB ON
2nd AMP
CASCODE AMP
SW AMP
AGC DET
VCA
GAIN AMP
CHROMA TRAP
L801, C812
REC SIGNAL
PB801
P1
PB 5V
PB FM(Y)
GND
SW PULSE
PB CHROMA
REC SIG
TR10
R32, 33
L13, C33
PEAKING AMP
TR9
EF
L12, C30
LPF
8MHz
D5
FL1
LPL + DL
3.0MHz
TR13, 14
REC AMP
TR12
MIX
VR1
REC Y CURRENT
TR2
TP5
IDL 5V
TR102
AMP
VR2
REC CHROMA CURRENT
PREAMP PCB
ICI EHM-M96A8U68K-2
W/D CLIP
MAIN EMPHA
CLAMP
FM MOD
SYNC SEP
DELAY
DET
AGC
PB AMP
SUB CLAMP
CLAMP DET
EE AMP
EE/VV AMP
V.SYNC
C.SYNC
TR19
R12
R13
C7
C8
C9
C10
REC FM MOD IN
REC MAIN EMPHA 2
REC MAIN EMPHA 1
REC/PLAY V-SYNC
REC/PLAY C-SYNC
REC/EE VIDEO IN
PB SUB CLAMP OUT
REC SUB CLAMP OUT
EE/REC/PB VIDEO OUT
PB LOW CHROMA
PB CHROMA MIX AMP IN
PB HIGH CHROMA OUT
PB COMB FILTER OUT
REC COMB FILTER OUT
TR105
TR107
LPF
C118
TR103
EF
DL101
COMB FILTER
TR112
AMP
VIDEO IN
VIDEO OUT
C134
C104
VIF UNIT
ACK
NTSC SECAM PAL
TR106
MESECAM : ON
R114
R134
R135
MISLOCK OUT
VIDEO MODE SELECTOR
SW101
MESECAM
B/W
PAL
C.KILLER
VCO
BGP
PB BPF OUT
REC
PB LPF OUT
REC BPF OUT
REC/PB C-SYNC
REC/PB SWITCHING PULSE

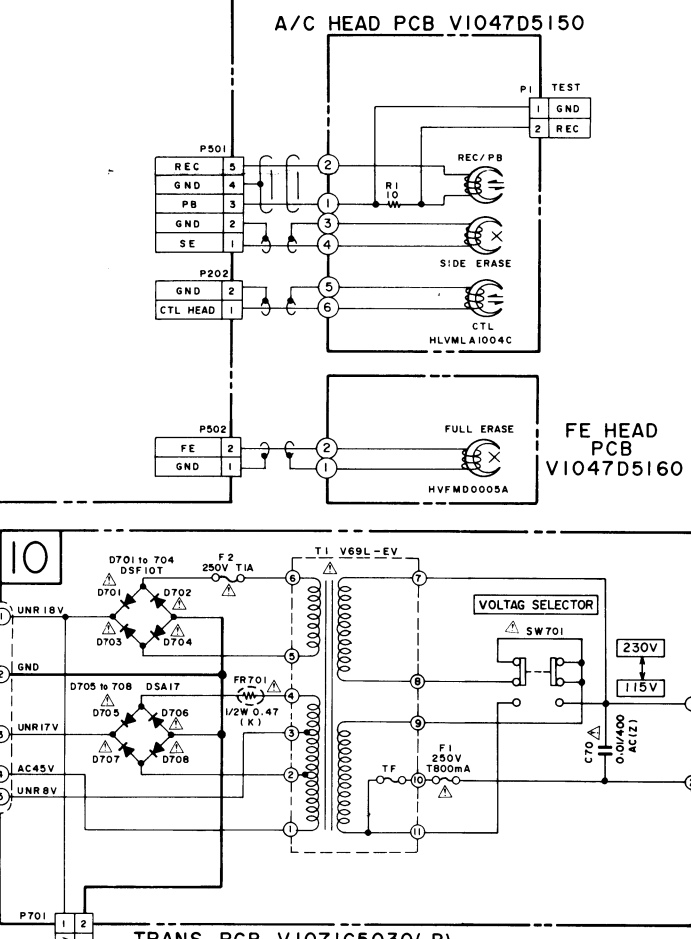


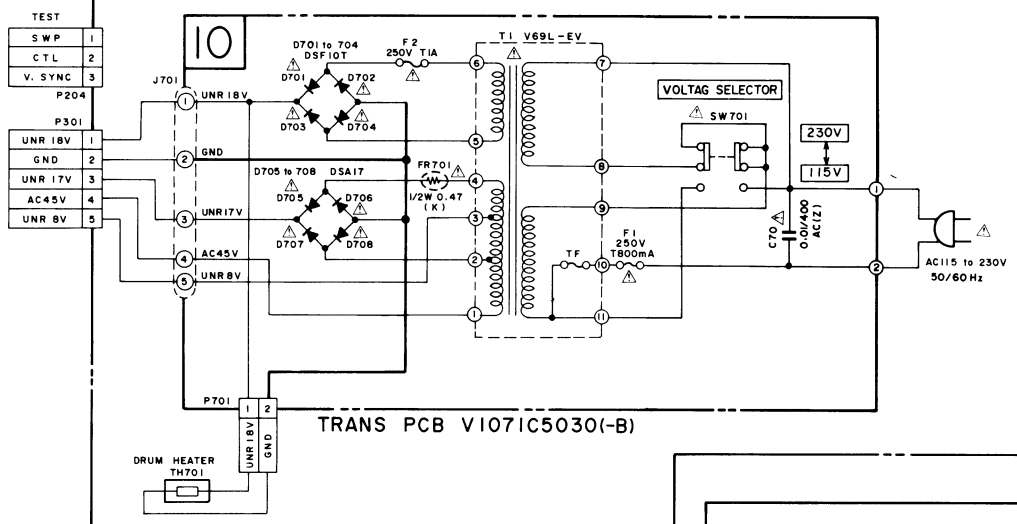
VS-220EV
VIDEO BLOCK DIAGRAM
NO.5-5 870413A4

VS-220EV

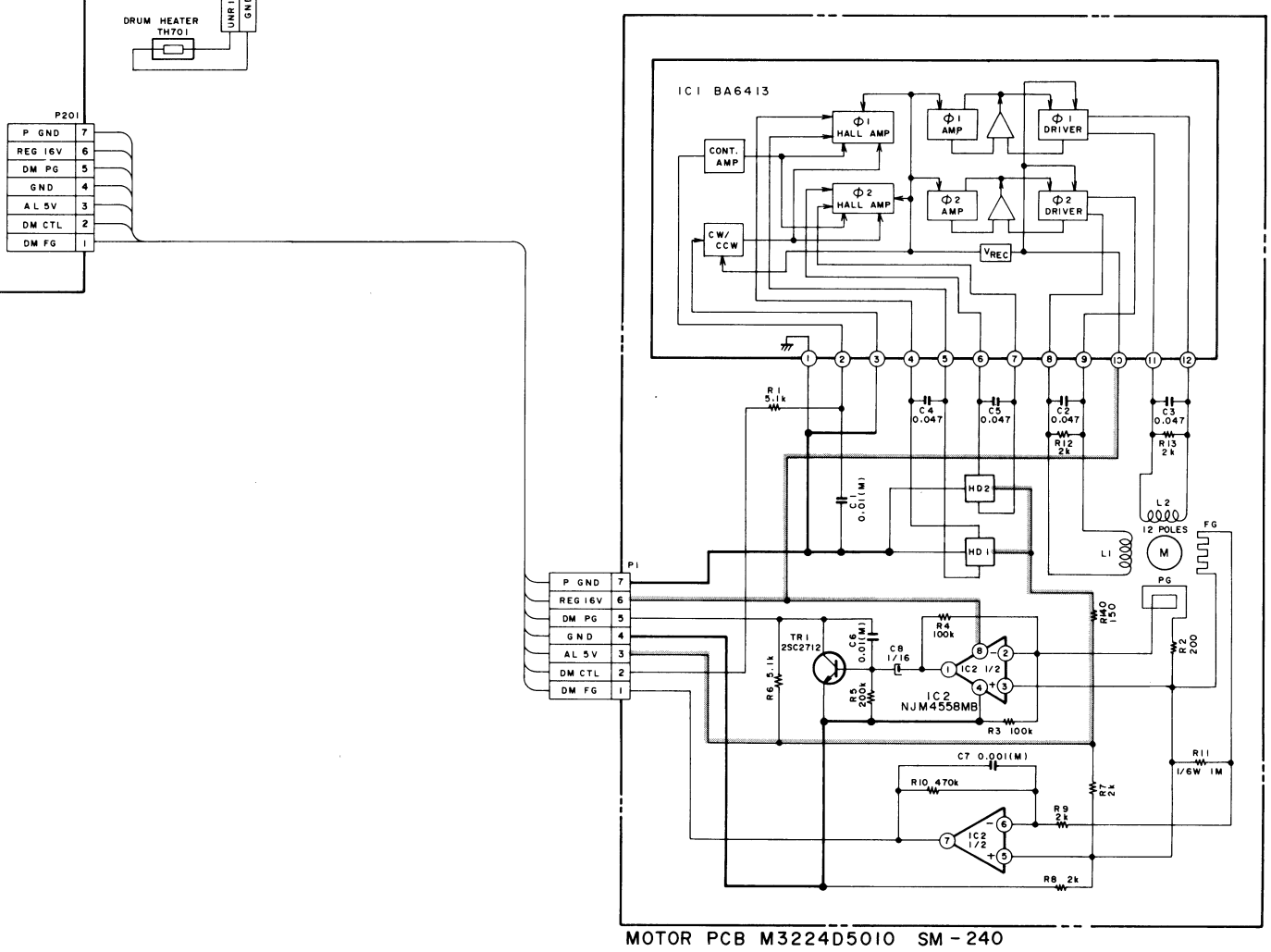

ROTARY TRANSFORMER
CH-2 VIDEO HEAD VH-131A/B
CH-1 VIDEO HEAD VH-131A/B
IC801 HA11752
TR803 2SD1330 (S,T)
TR804 2SD1330 (S,T)
TR802 2SD1302 (S,T)
TR801 2SC2603 (D,E,F)
SW
AGC DET
FM AGC
GAIN SW
TPB01 REC CURRENT
PREAMP PCB V1071A5040(-A)
P801
P1
PB 5V
PB FM
GND
SWP
PB LC
REC SIG
VIDEO
AUDIO
IN
OUT
TUNER UNIT
TEMD1-004AEG
RF IN
VIF UNIT
VIF BLK VS-240EG
RF CONVERTOR/ BOOSTER EV
ANT IN
RF OUT
VTR TV OUT
RF CONVERTOR
OPERATION PCB V1071A5020
J904
J903
J902
J901
P410
P409
P408
P407
SO/SI
SI/SO
SC
B/V
RESET
V.SYNC
H.SYNC
VOW
IDL 5V
REC
PLAY
TV/VIDEO
NC
TIMER
AFT
VT
33V
UHF
VH
VL
AL 5V
TRACK.
SOFT
PICTURE
SHARP
MAIN PCB V1071A5010(-C)
P404
P406
P402
P403
P401
P405
P203
TRP(C)
START S
END S
C SW B
C SW A
LAMP
AL.12V
REC SF
EJ SW
LM (-)
LM (+)
POS 3
POS 2
POS 4
POS I
CM FG
CM ⊖
CM ⊕
05
PH1 ON2170 (Q,R)
R1 180
SENSOR REEL PCB V1071D5500
TR1 PN268(R,S)
SENSOR (L) PCB V1047D5140
DI LN59
SENSOR LED PCB V1047D5100
SENSOR(R) PCB V1071D5510
SWITCH EJ PCB V1030D5190
EJECTOR PCB
REC SAFETY SW
SW1
EJECT SW
SW2
LOADING MOTOR
M903
MXN13BD10A
ROTARY ENCODER D2ZQ-R9
(on the loading mecha blk.)
FG
CAPSTAN MOTOR KCX-38F55A
B(POWER SUPPLY) LINE







TRANS PCB V1071C5030(-B)



MOTOR PCB M3224D5010 SM-240

INDICATED VOLTAGE MEASURED ON PB MODE AND INDICATED WITH ( ) MARKS MEASURED ON REC MODE.

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

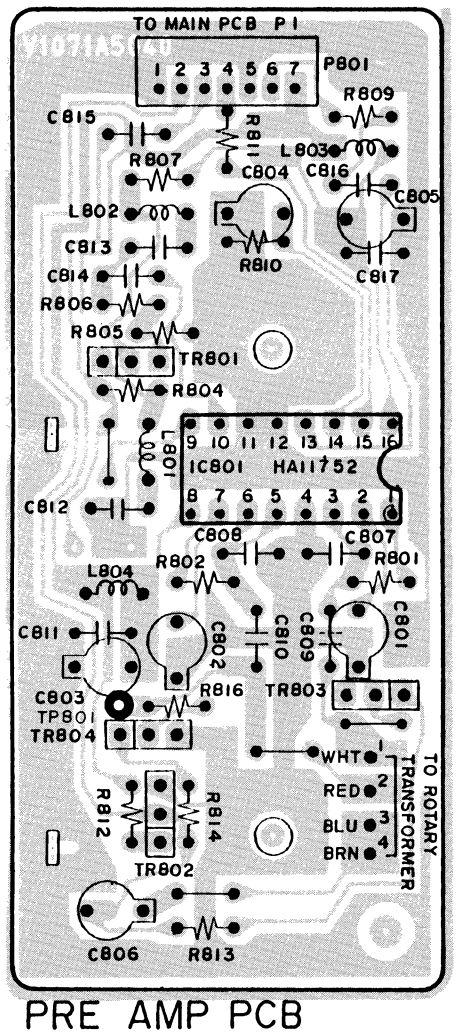
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

NOTE

UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50WV(J)

VS-220EV CONNECTION DIAGRAM

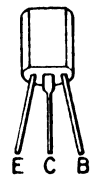
NO. 4-1 870414A3



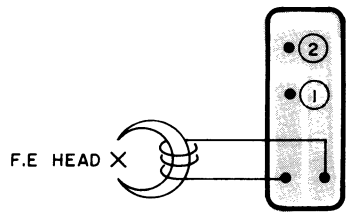
PRE AMP PCB
V1071A5040(-A)

2SC2603

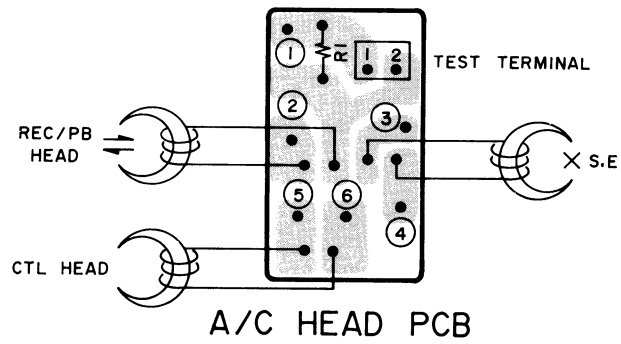
2SD1330



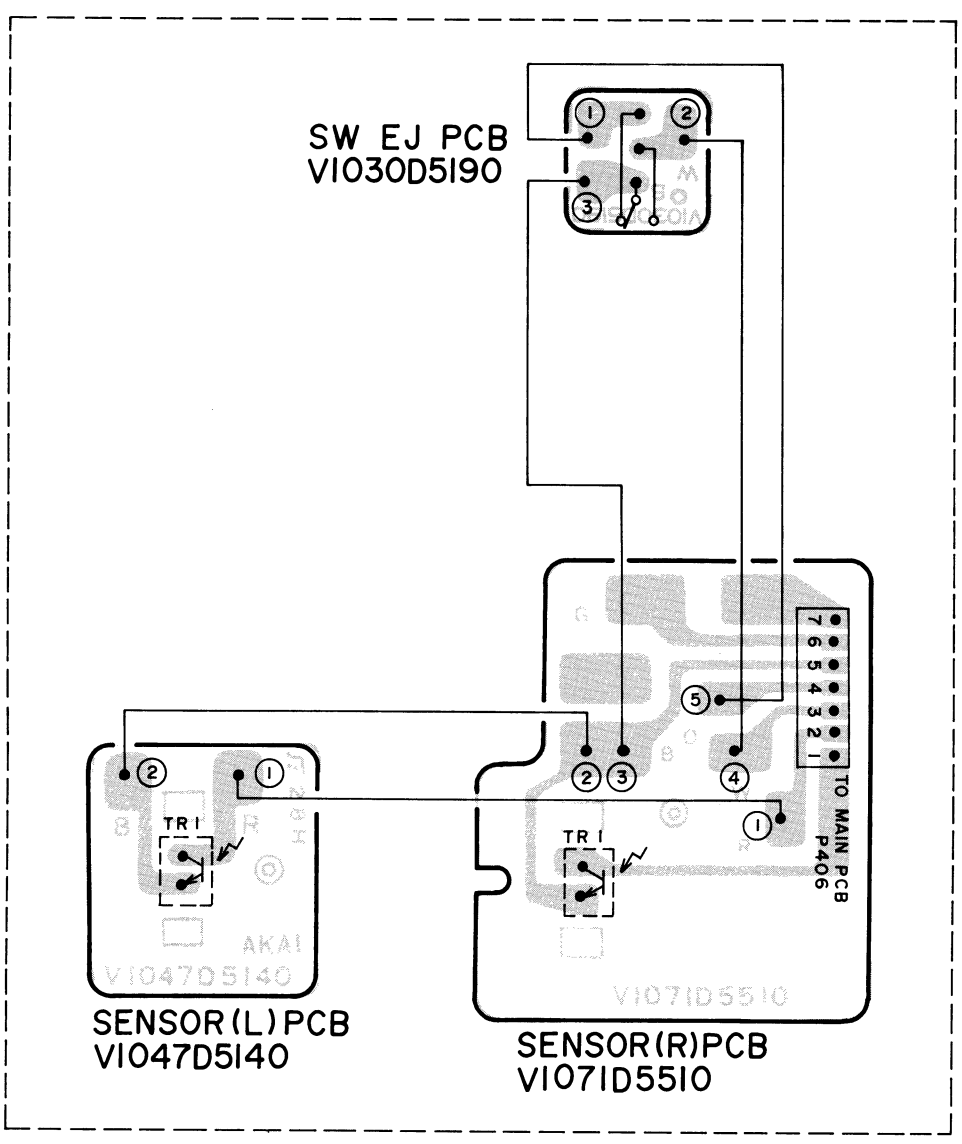
2SD1302



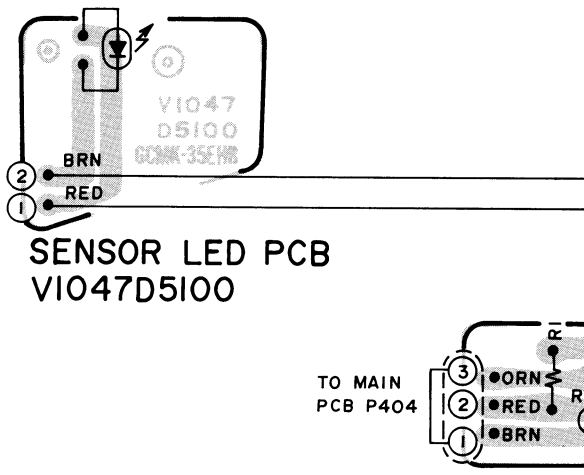
F.E HEAD PCB
V1047D5160



A/C HEAD PCB
V1047D5150



EJECTOR BLOCK

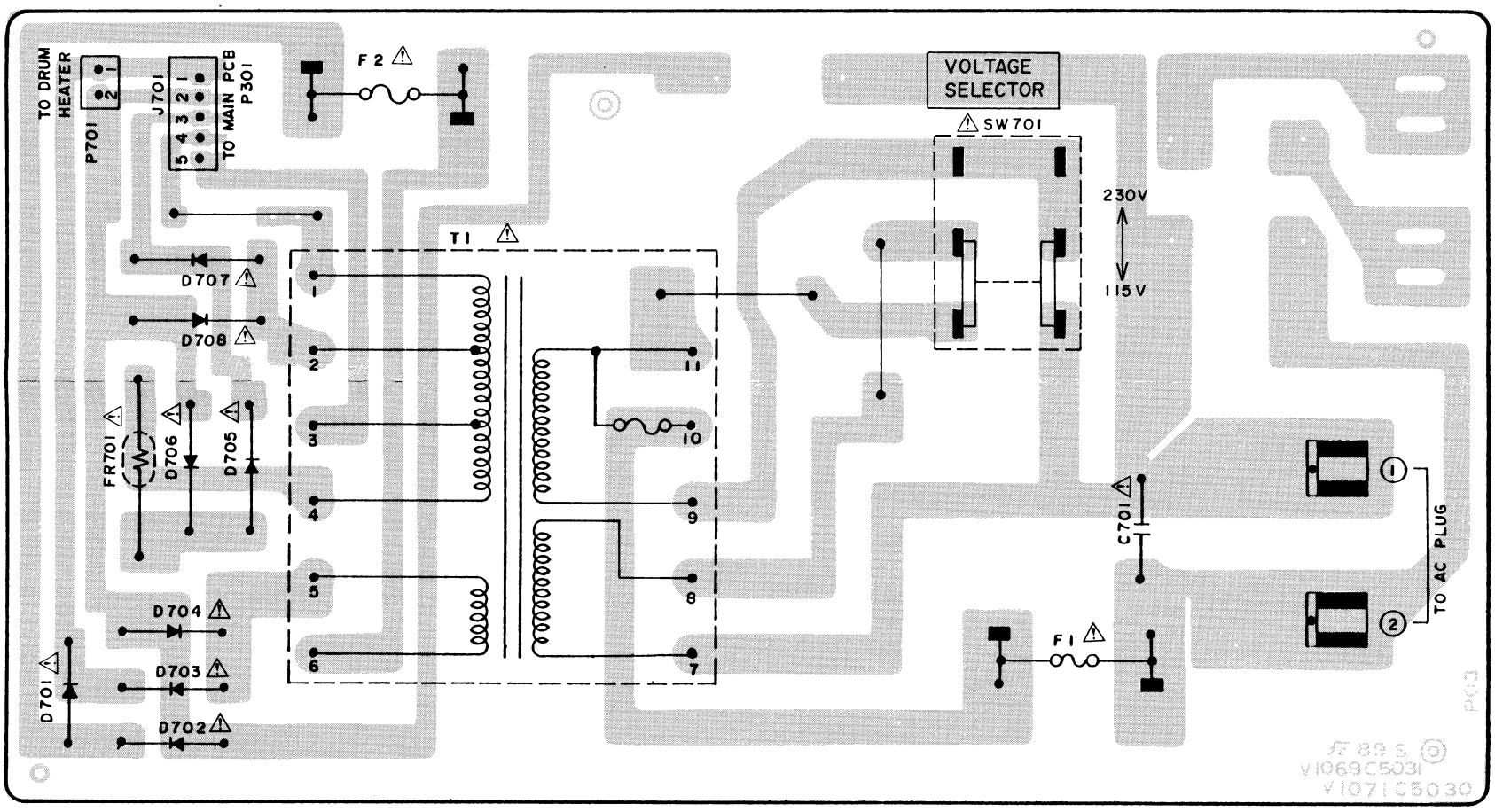


AD PCB
05160

TEST TERMINAL

S.E HEAD

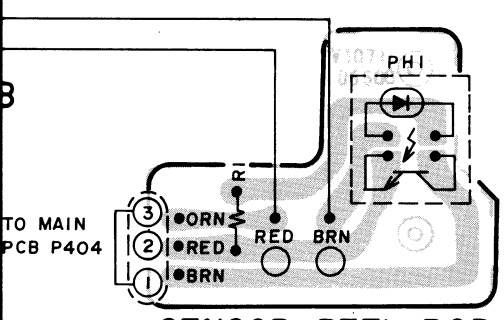
D PCB
150



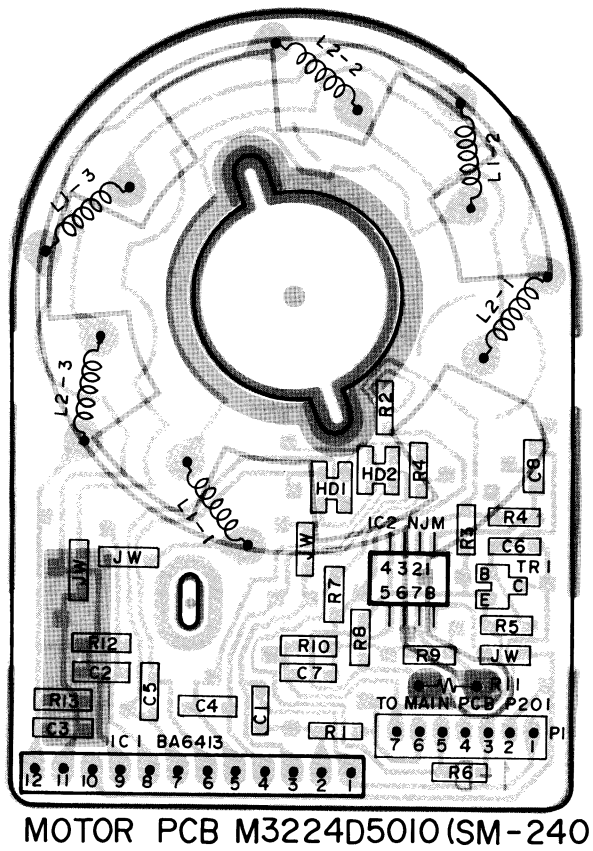
TRANS PCB V1069C5031(-B)

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT



SENSOR REEL PCB
V107ID5500



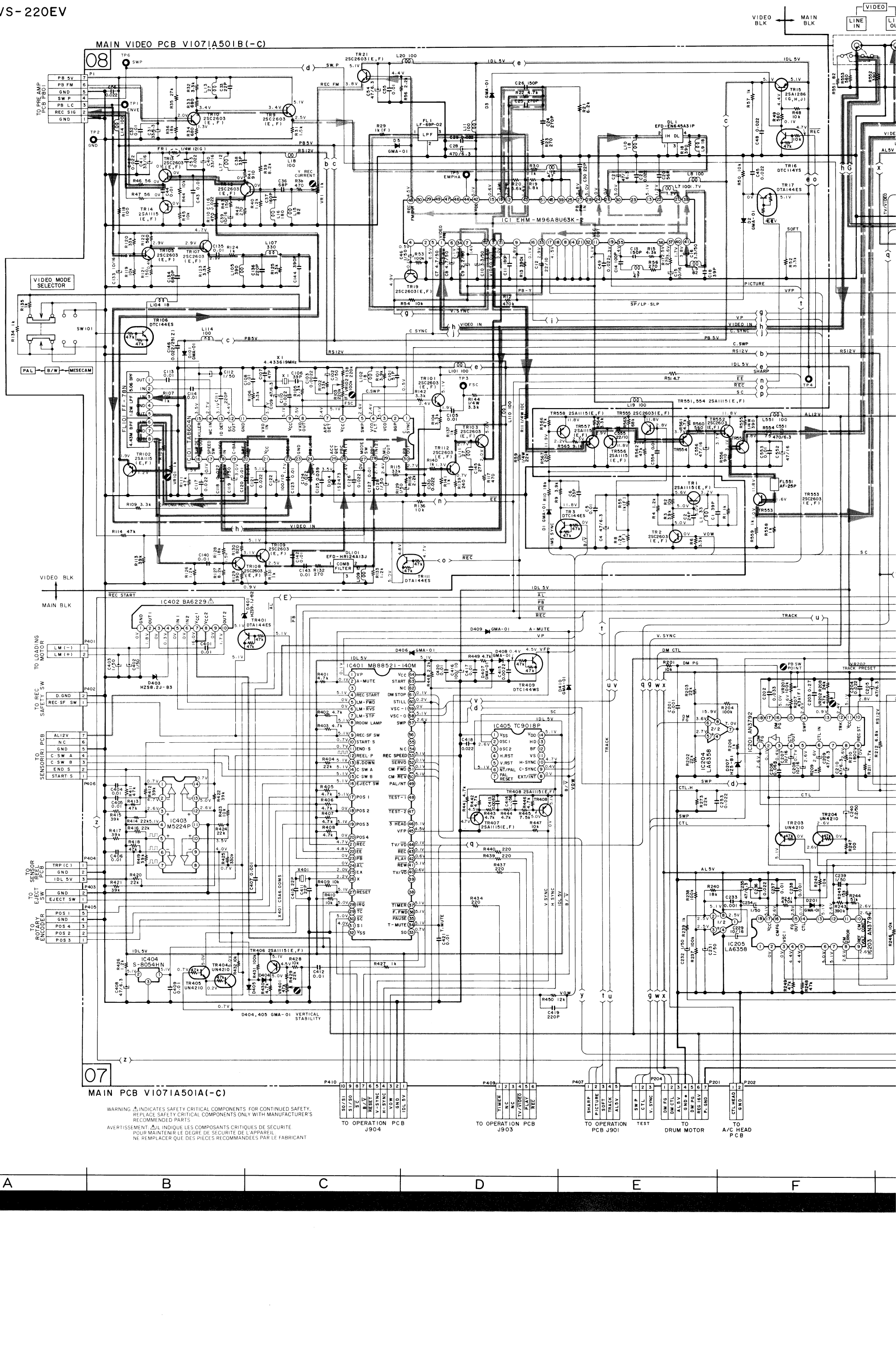
MOTOR PCB M3224D5010(SM-240)

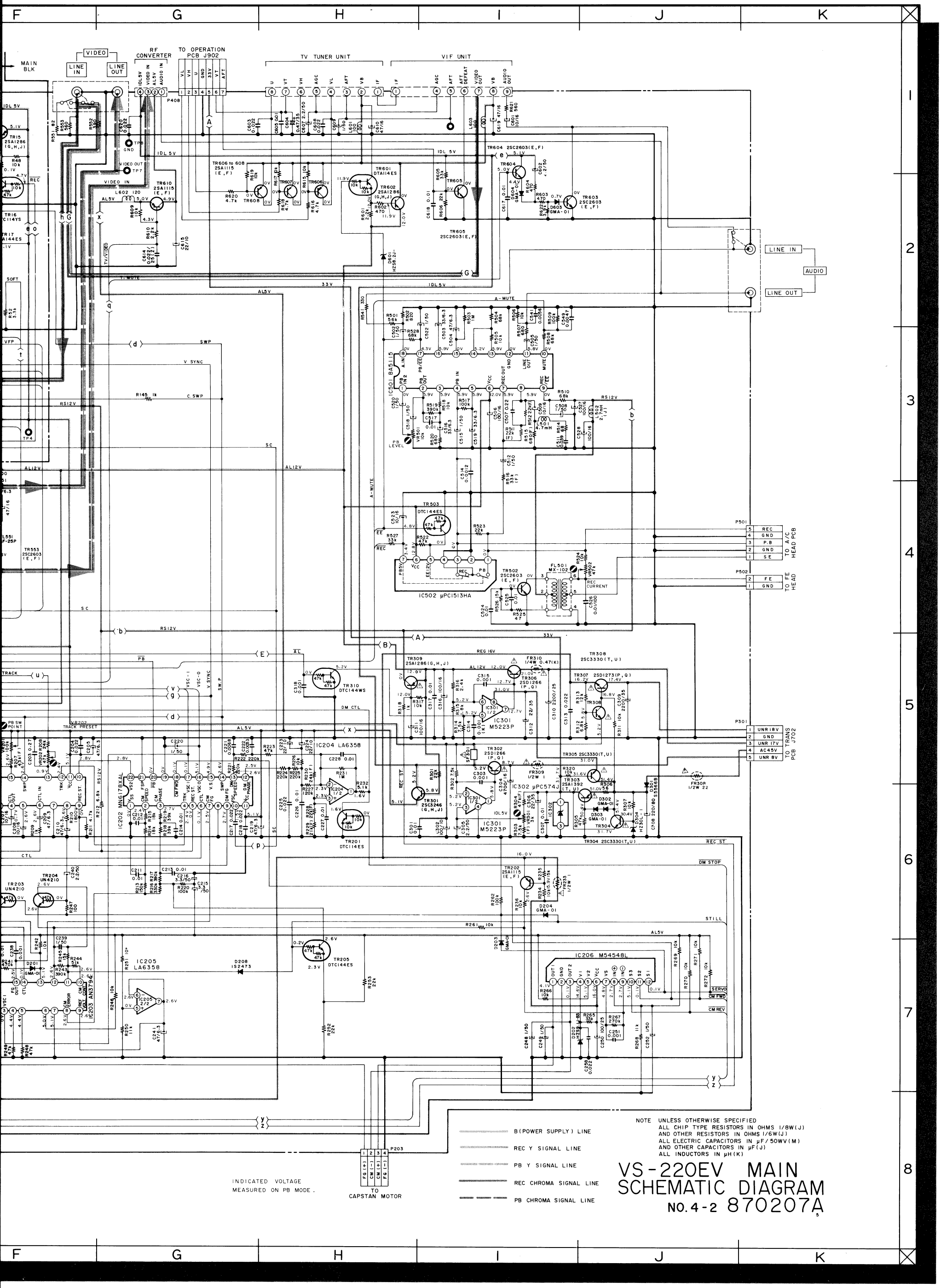
JW = JAMPER WIRE

R1 = R1

C1 = C1

VS-220EV


MAIN VIDEO PCB V1071A501B(-C)
08
TO PRE AMP PCB PB01
PB 5V
PB FM
GND
SW P
PB LC
REC SIG
GND
VIDEO MODE SELECTOR
PAL
B/W
MESECAM
IC101 TA8604N
IC402 BA6229
IC401 MB88521-140M
IC403 M5224P
IC404 S-8054HN
IC405 TC9018P
IC201 AN3792
IC204 LA6358
IC205 LA6358
IC203 AN3794
IC1 EHM-M96A8U63K-20
X1 4.433619MHz
X401 CSA6.00MS
VIDEO BLK
MAIN BLK
TO LOADING MOTOR
TO REC SAFETY SW
TO SENSOR(R) PCB
TO SENSOR REEL PCB
TO EJECT SW
TO ROTARY ENCODER
07
MAIN PCB V1071A501A(-C)
TO OPERATION PCB J904
TO OPERATION PCB J903
TO OPERATION PCB J901
TEST
TO DRUM MOTOR
TO A/C HEAD PCB
WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



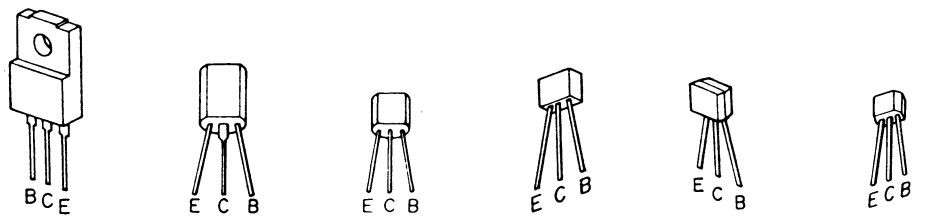
NOTE UNLESS OTHERWISE SPECIFIED
ALL CHIP TYPE RESISTORS IN OHMS 1/8W(J)
AND OTHER RESISTORS IN OHMS 1/6W(J)
ALL ELECTRIC CAPACITORS IN μF/50WV(M)
AND OTHER CAPACITORS IN μF(J)
ALL INDUCTORS IN μH(K)

VS-220EV MAIN SCHEMATIC DIAGRAM

NO.4-2 870207A
5

TRANSISTOR's

TR 1....F5
TR 2....F5
TR 3....F5
TR 9....E6
TR 10....E6
TR 12....D6
TR 13....D6
TR 14....D6
TR 15....D6
TR 16....CD5,6
TR 17....C5,6
TR 19....G5
TR 21....E6
TR101....A6
TR102....C6
TR103....C6
TR105....D6
TR106....C6
TR107....C6
TR108....B6
TR109....B6
TR111....B5
TR112....B5,6
TR201....E3
TR202....C3
TR203....D3
TR204....D3
TR205....C3
TR301....C1
TR302....C1
TR303....C1
TR304....C1
TR305....C1
TR306....D1
TR307....C2
TR308....D2
TR309....C2
TR310....D2
TR401....A2
TR404....A1
TR405....A1
TR406....A1
TR407....AB4,5
TR408....A4,5
TR409....B2
TR502....G3
TR503....G3
TR551....G4
TR552....G4,5
TR553....G4
TR554....G5
TR555....G4,5
TR556....F5
TR557....F5
TR558....F4
TR601....E2
TR602....F1
TR603....E2
TR604....F1
TR605....F1
TR606....F1,2
TR607....FG1
TR608....F1
TR610....G1



2SD1266 2SD1273	2SA1283 2SA1286 2SC3246	2SA1392	UN4210	DTA144ES DTC114ES DTC144ES DTC144WS	2SA1115 2SC2603 2SC3330

PRINCIPAL PARTS LOCATION

IC's

IC 1....FG6
IC101....A6
IC201....E4
IC202....D4
IC203....D3,4
IC204....E3
IC205....E3
IC206....D3
IC301....CD1
IC302....C2
IC401....AB3
IC402....B1,2
IC403....AB1
IC404....A4
IC405....B4
IC501....FG4
IC502....FG3

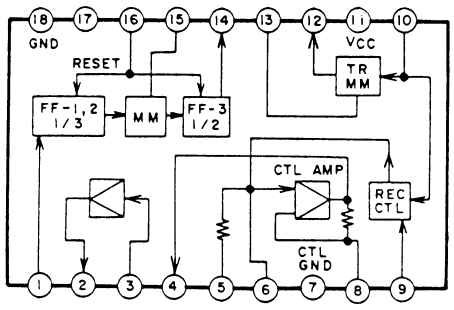
CONNECTIOR's

P 1....DE6
P201....E3
P202....E4
P203....E3
P204....E4
P301....E1
P401....B2
P402....A3
P403....A3
P404....A2
P405....A3
P406....B1
P407....A2
P408....A2
P409....A3
P410....A3,4
P501....FG3
P502....F3

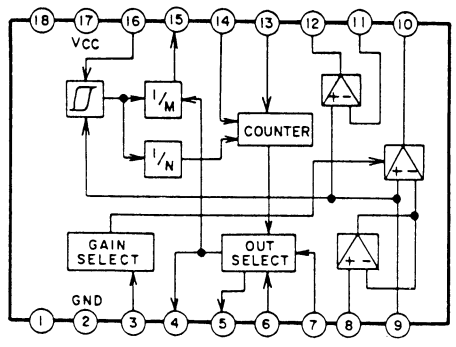
WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

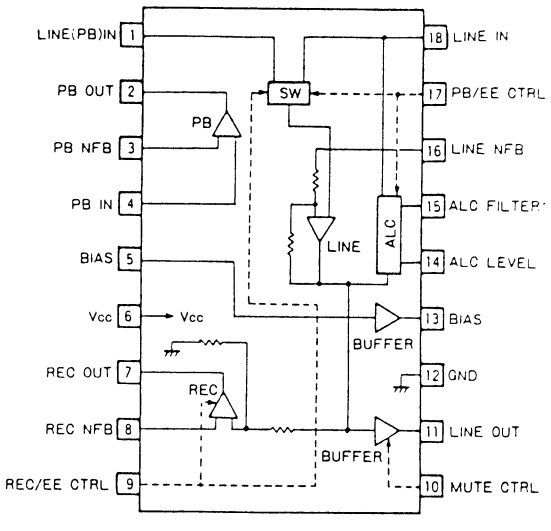
AN3792 (DRUM SERVO INTERFACE IC)



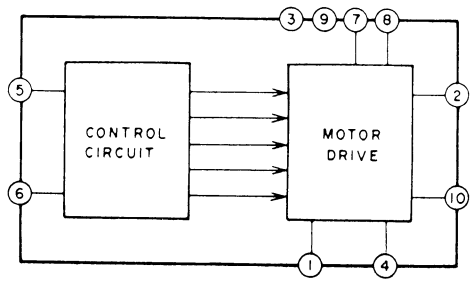
AN3794 (CAPSTAN SERVO INTERFACE IC)



BA5115 (SWITCHLESS REC/PB AMPLIFIER)



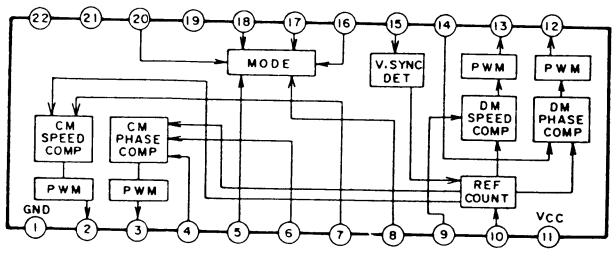
BA6229 (BI-DIRECTIONAL MOTOR DRIVER)



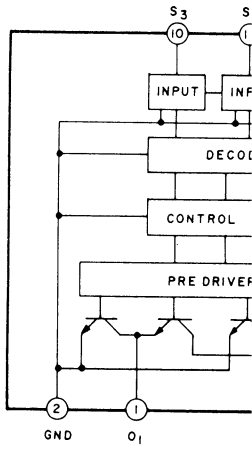
CONTROL MODE

MODE	INPUT		OUTPUT	
	5pin	6pin	2pin	10pin
STOP	L	L	OPEN	OPEN
NORMAL	H	L	H	L
REVERSE	L	H	L	H
BRAKE	H	H	L	L

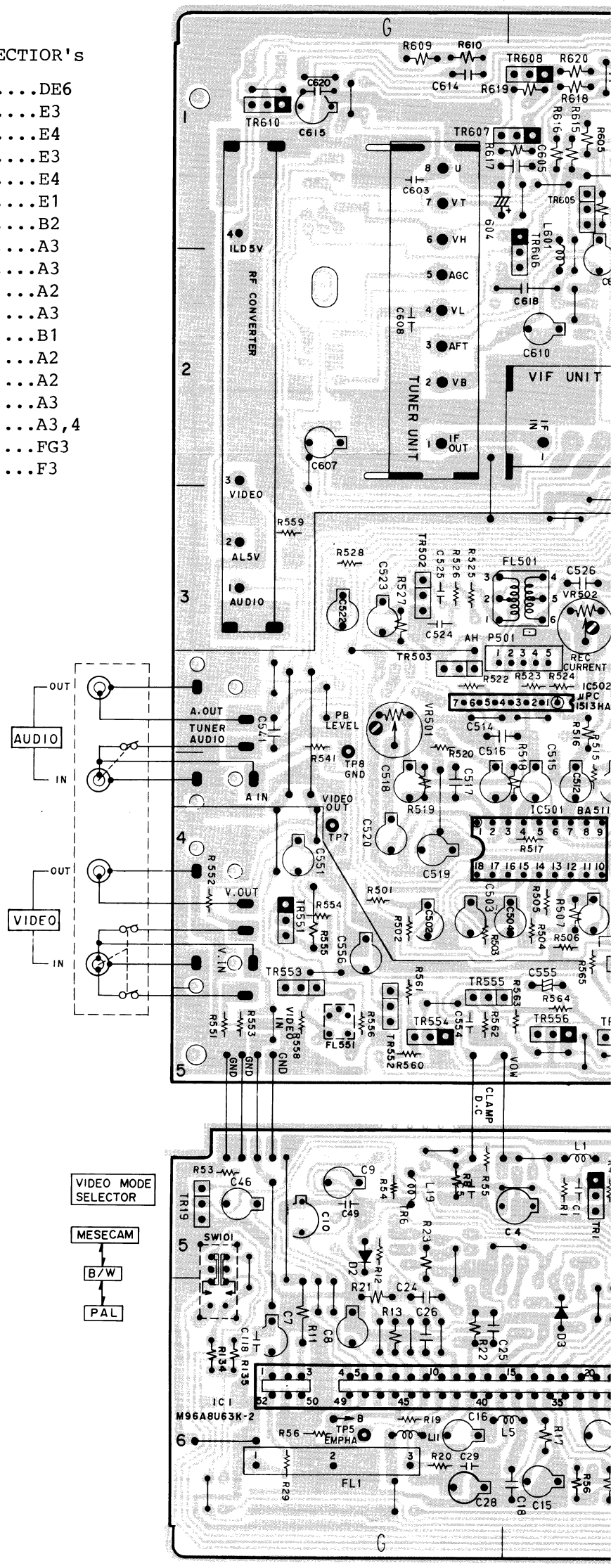
MN6178XAL (DIGITAL SERVO IC)



M54548L (CAPSTA

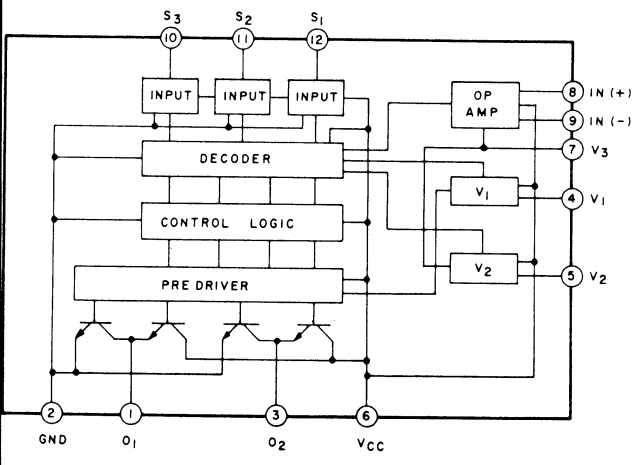


MAIN PCB V1069A501A(-C)



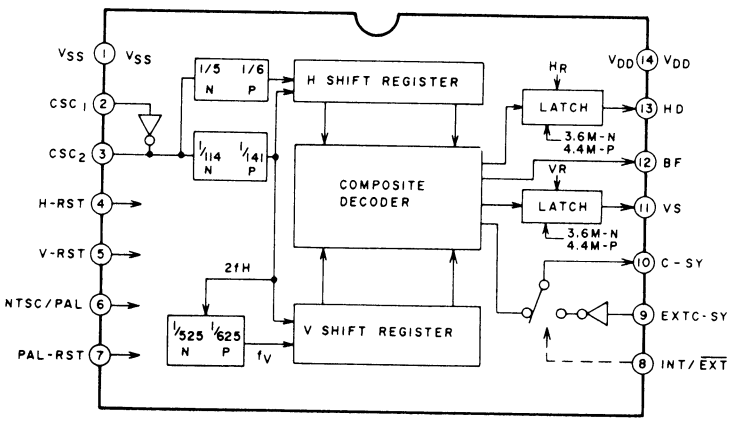
MAIN (VIDEO) PCB V1069A501B(-C)

M54548L (CAPSTAN DRIVE IC)

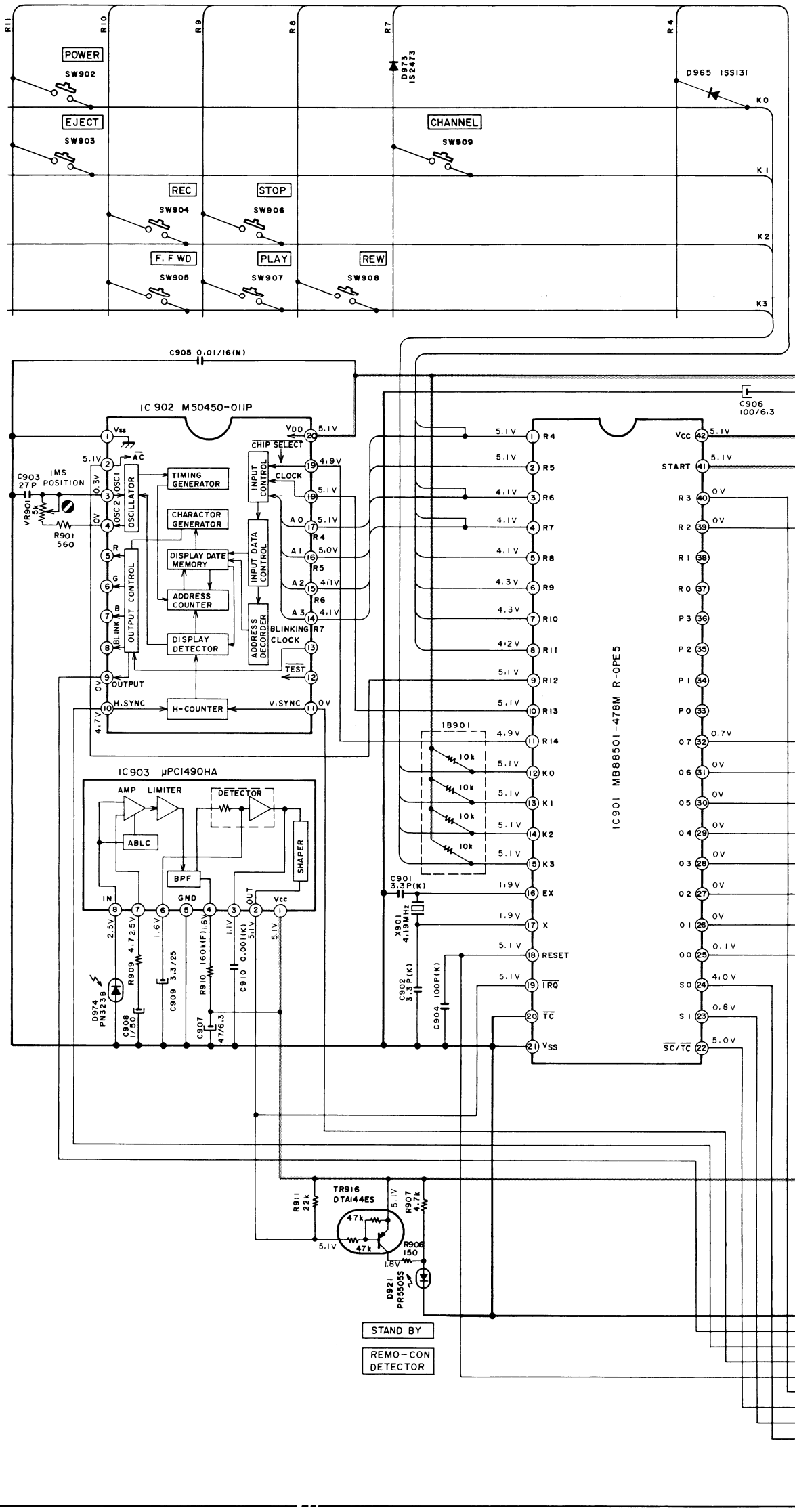


INPUT			OUTPUT		Vcc SELECT	MODE
S_1	S_2	S_3	$\bar{O}_1$	$\bar{O}_2$		
L	L	L	"OFF" state	"OFF" state	–	STOP
L	L	H	H	L	Vs	PLAY (+)
L	H	L	L	H	Vs	PLAY (–)
L	H	H	H	L	V_2	FF (2)
H	L	L	L	H	V_2	REW (2)
H	L	H	H	L	V_1	FF (1)
H	H	L	L	H	V_1	REW (1)
H	H	H	L	L	Vs	BRAKE

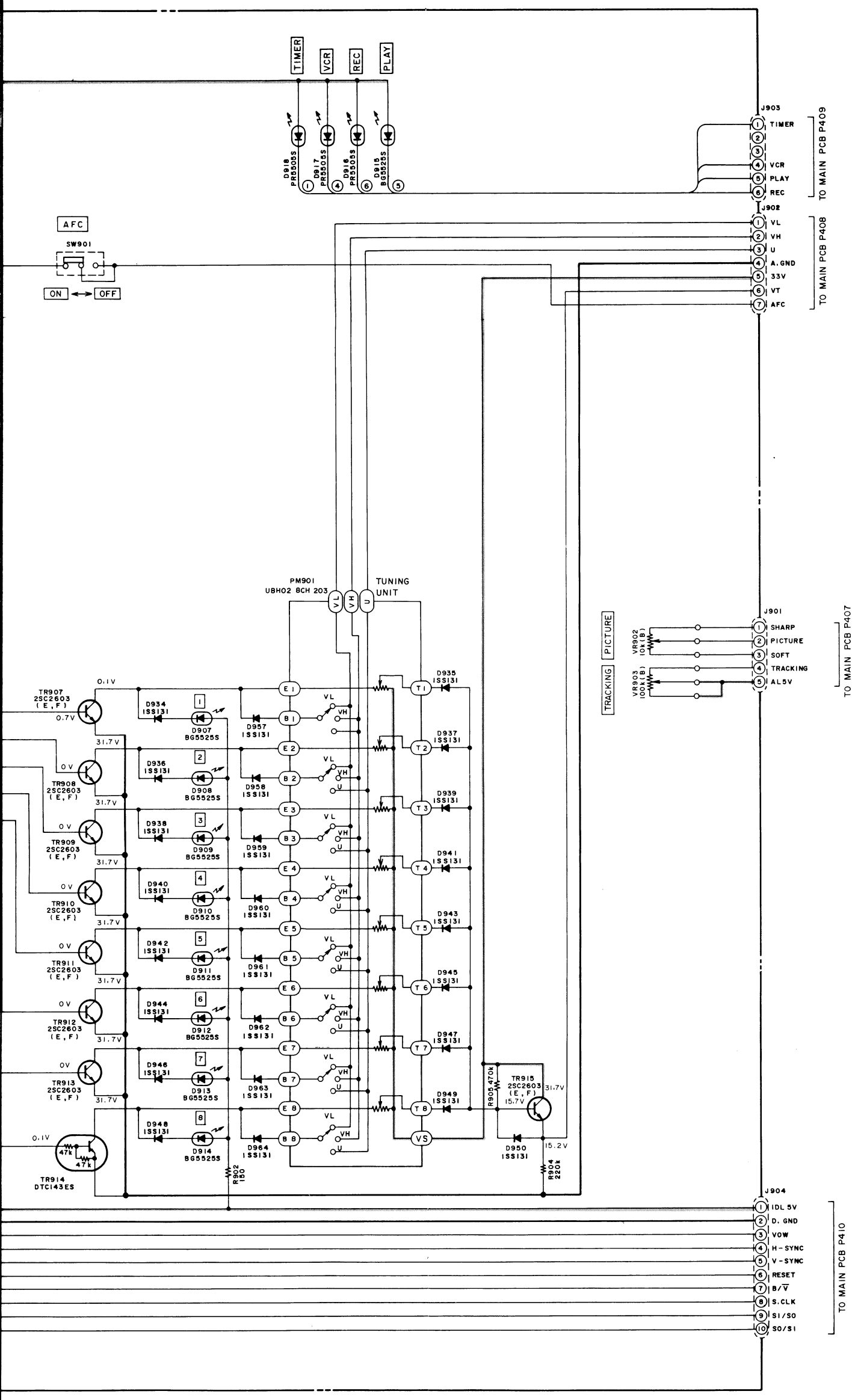
TC9018P (TV SYNC GENERATOR)



09



OPERATION PCB V1071A5020



NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50 WV(J)

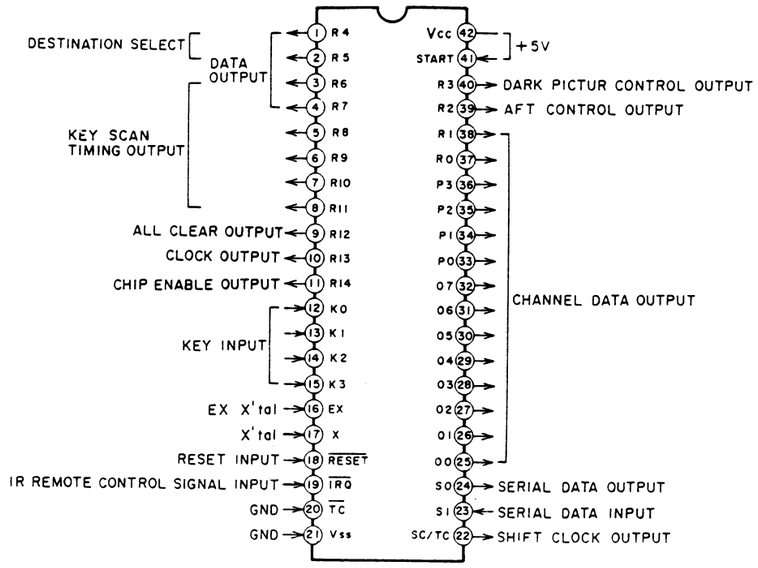
= +B (POWER SUPPLY) LINE

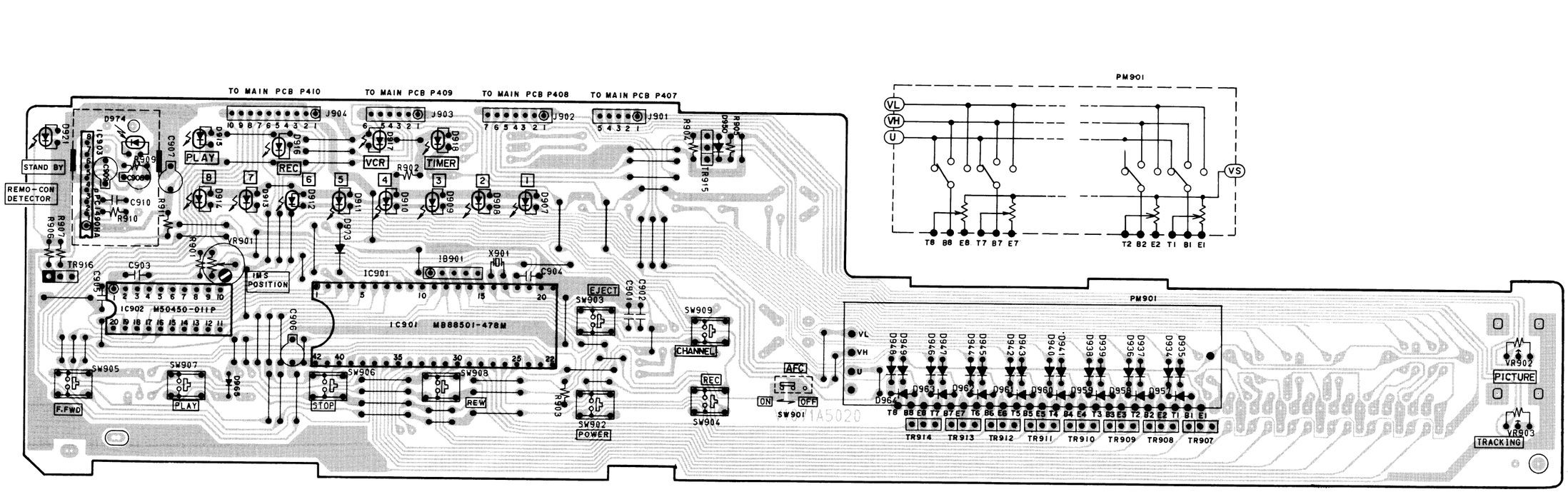
VOLTAGE MEASURED ON EE (STOP) MODE.

VS-220EV OPERATION SCHEMATIC DIAGRAM

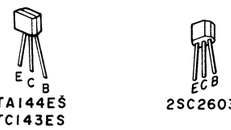
NO.4-3 870208A
3

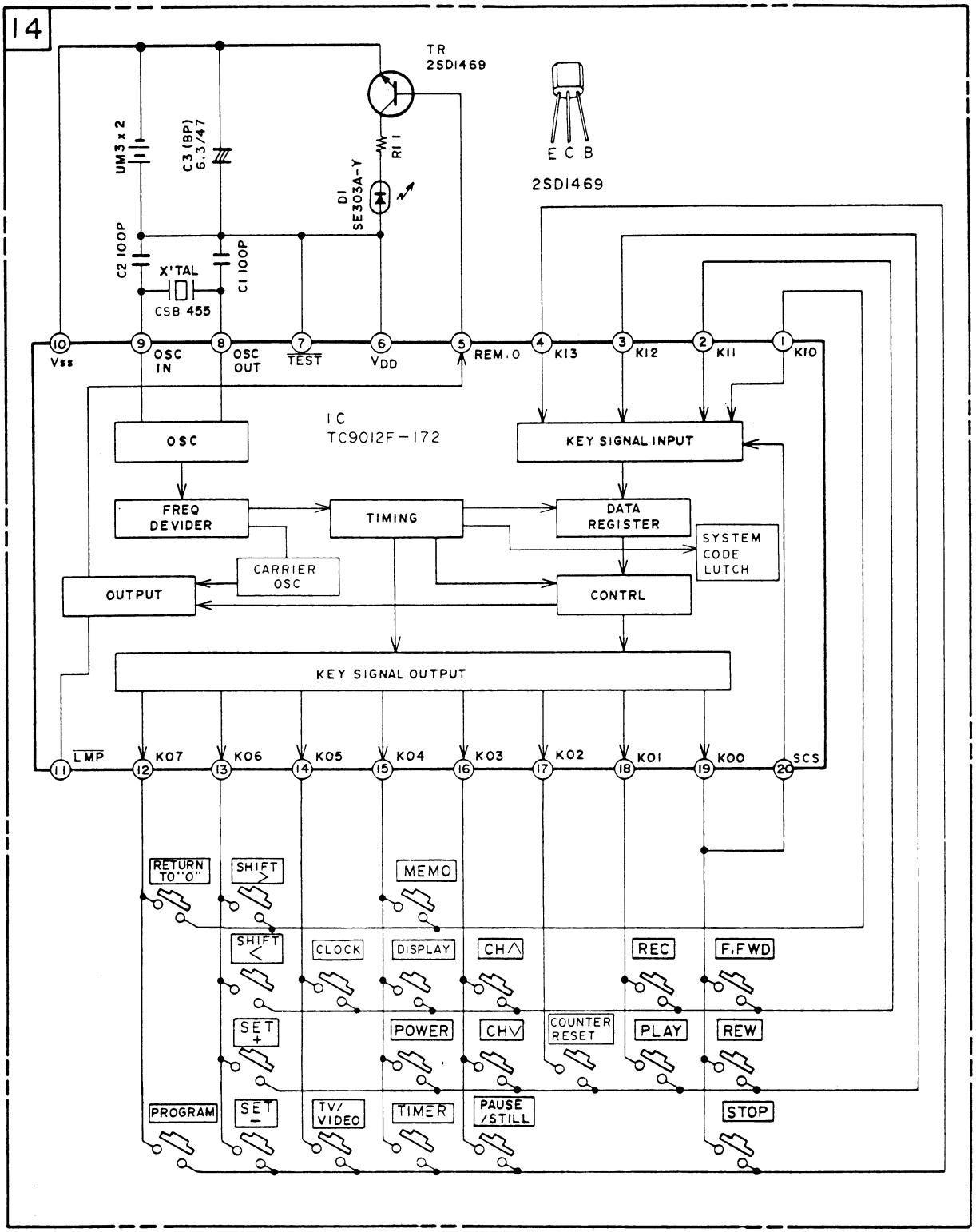
MB88501-478M (OPERATION CPU)





OPERATION PCB V1071A5020





NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/5W(J)
ALL CAPACITORS IN μF 50WV(J)

RC-V220A
REMOTE CONTROL UNIT
SCHEMATIC DIAGRAM

NO.4-4 860707C (A4)